# SUPPLEMENT.

# The Mining Journal,

## RAILWAY AND COMMERCIAL GAZETTE:

**FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.**

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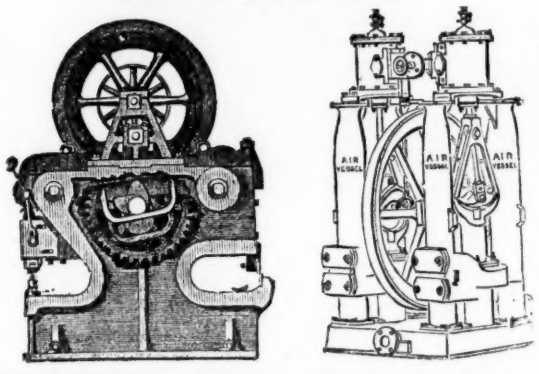

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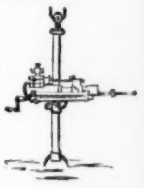

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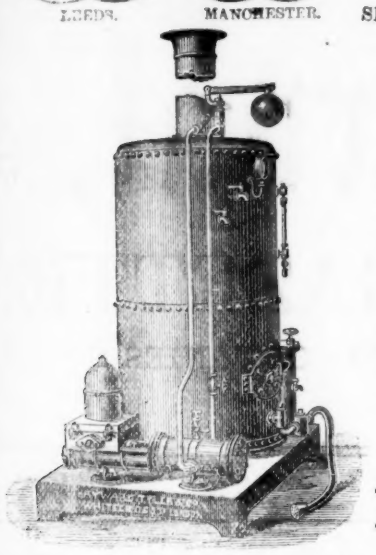

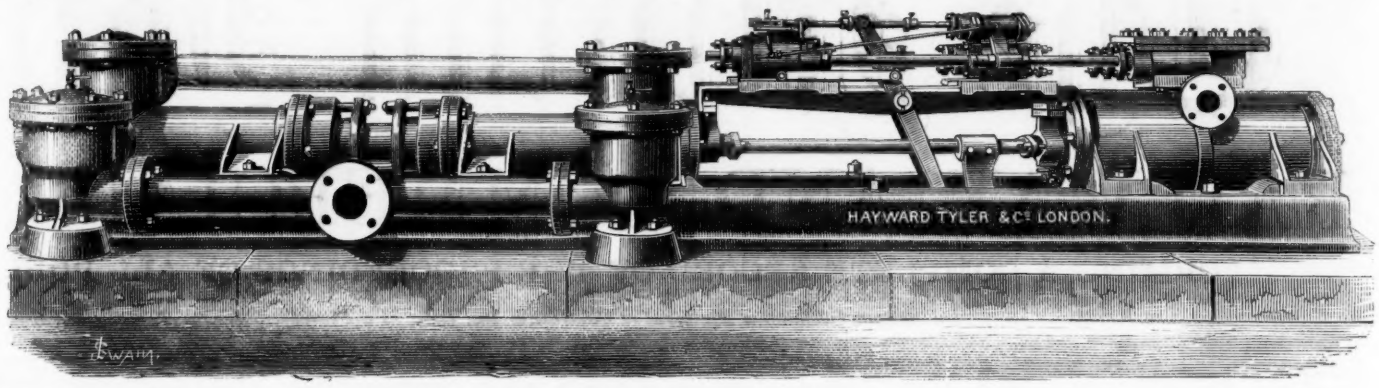


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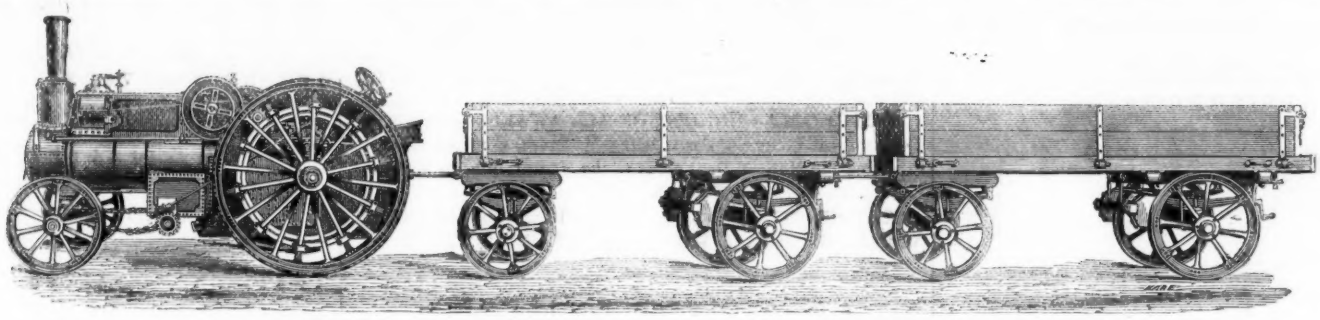

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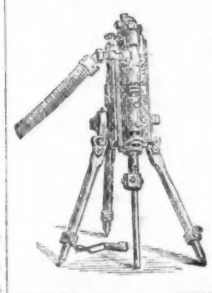

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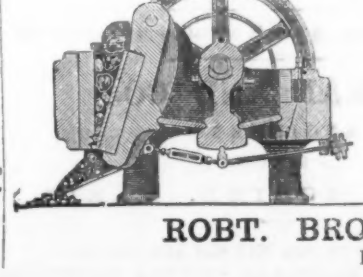

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## Original Correspondence.

### TASMANIAN TIN FIELDS—No. IV.

SIR,—I will now proceed to give you an account of the North-East Coast tin producing claims, roads, and character of the country generally. The most direct route to Mount Cameron from Upper Ringarooma is to cross the Ringarooma river at the ford, about three miles from Mr. G. Fry's farm, then through the glue-pot over the Billy Cock tier to Scotsdale, a distance of 20 miles, a good day's journey for any horse. The road for nearly the whole distance is a continuation of slush and bog-holes. On to Bridport, Lyndhurst, then to Boobyalla, and the Ringarooma Port. Bridport is situated on the Brid river, over which there is a bridge which was erected some eight years ago, and is approached by a long corduroy embankment now full of holes, where the smaller logs have rotted away. The bridge itself is sinking slightly in the middle, the centre supports being almost useless to take the strain, and consisting of two gallows-like structures, kneed in the angles and bolted together. The port is formed by the Trent, or great Forrester river, which falls into the sea about a mile below at Anderson's Bay. The Brid is a smaller stream, emptying into the other at right angles about 100 yards below the bridge. It is a bad port, having a dangerous bar with only about 15 or 18 in. of water on it at low tide, and from 6 to 8 ft. at high water. The channel is narrow and very winding, with a depth of from 5 to 6 ft. at low water. It is, however, the shipping port for Scotsdale and Upper Ringarooma, and the bulk of the tin from the central and western portions of Upper Ringarooma comes down this way. There is no jetty, but vessels lie alongside a great ballast heap, and are loaded along planks laid to the stores. Mr. T. Diprose acts as agent here for the various claimholders, and at the time of my visit there were about 12 tons of tin ore in the store awaiting shipment; this port is 12 miles from Scotsdale. I must defer a further description of this part and push on for Mount Cameron. There are two routes which may be taken, one runs eastward out of the township parallel with the Forester river for some three miles, and then crosses it over a bridge and proceeds along the coast close to the sea at first, but afterwards running several miles inland through Waterhouse. The other route is to cross the Forrester river at the port, either by boat or by swimming the horse when the tide is out, and joining the other route a few miles along, but shortening the journey by about two miles. In either case the noted Stevenson's marshes must be passed through, and they are a terror to the traveller. The Great Forrester runs for some miles parallel to the sea about a mile distant, and between it and the range of sandhills which border the sea beach lies an immense marsh, affording good pasture for cattle during the drier months of the year, but almost totally covered with water in winter. At the time of my passing through it was a succession of dry land and lagoons, and for over five miles one has to splash in and out of these, the only escape being to take the sand hills where practicable. Emerging from these the road passes through a track of low undulating country several miles wide, which extends all along the coast from the sea to the ranges on the south; it is poor sandy or quartz gravel loam, the road being dry on the tops of the low hills, and wet and boggy in every creek and depression, with extensive marshes in all directions. It is scantily timbered, bears little but grass trees, coarse grasses, and stunted scrub, and is one of the most dreary, desolate, and monotonous roads to travel on in the colony: 16 miles from Bridport we come to the deserted township of Lyndhurst, on the Waterhouse diggings, the scene of the wildest, madest, and most reckless outbreak of "gold fever" ever experienced in Tasmania. In 1869 a young man out kangaroo hunting was sitting on a log waiting for his dogs to come up, and idly picked up some pieces of quartz lying at his feet. He found gold in them, and the result was the Waterhouse rush. No alluvial gold leads were found, but plenty of reefs. No end of companies were floated, machinery was put up, a few crushings took place, and then everything collapsed, the only persons benefited being a few speculators. The machinery was carted away, many of the buildings were sold and removed, and there now remain nearly 30 houses empty and tenantless, the only resident on the spot being an old man, known as Jack Weldon, who is in charge of the Government buildings, and provides accommodation for travellers since the traffic to the tin mines has sprung up, Waterhouse making a good half-way resting place in going to or from Mount Cameron.

The road onward from Waterhouse passes through even more desolate country than that before described, the only living thing seen being a few lots of cattle on the Waterhouse station. The land is in some parts poor for heath, and hardly bears a tree, grass tree, and coarse natural marsh grasses being the principal vegetation. A good deal of money was laid out by the Government on the road to the shipping port at the mouth of the Tomahawk, and through the worst marshes it is thrown up and formed with good side drains, and it is dry and firm in any weather. Seven miles from Lyndhurst the road to the shipping place turns off from the other to the left, but keeping straight on the Tomahawk river is reached. Nearly nine miles from the township we have passed the White Rock range of hills lying a few miles south. Mount Horror is plainly visible from Waterhouse; and after passing the Tomahawk, Mount Cameron comes in view to the south-east. The road still winds through the endless desolate flats, and low, lightly timbered rises. And as we near the Boobyalla river we have a fine view of Cape Portland northwards, with the long outlying land running far out to sea. The Blue Tier comes in sight here as we look south-eastward up the valley of the Ringarooma. The Ringarooma river is the finest along this coast, and drains an immense area. Rising on the eastern side of Mount Maurice, only 35 miles from Launceston, it pursues a tortuous course, receiving a great number of tributaries, and finally empties itself into Ringarooma bay—a mile and a half from Ringarooma township. It is the best port on the north-east coast, but has the usual bar at its mouth, on which there is less than 2 ft at low water, and from 6 ft. to 8 ft. at high water, the average being about 7 ft. Once inside vessels are safe in any weather, and though the channel is a winding one it is well defined, and has a good average depth of from 4 to 5 ft. at low water. The river is about 400 yards broad at high water. There are two small vessels trading between this port and Launceston, known as the North Star and the Teazer, which took to town in the middle of June, 1876, from 11 companies' works, 14 tons 2 cwts. 3 qrs. 2 lbs. of tin ore; the largest quantity belonging to the Prince of Wales Company—1 ton 14 cwts. on June 19 (which is the week following the arrival of the first parcel of ore). Thirteen companies sold 11 tons 16 cwts. of tin ore. On June 26, 21 companies sold 59 tons 7 cwts. 1 qr. 4 lbs. of tin ore, out of which the Full Moon Company owned 16 tons 16 cwts. 2 qrs. 24 lbs., and the All Nations Company 15 tons 15 cwts. 2 lbs., leaving for the remaining 19 companies an average of 1 ton 8 cwts. 21 lbs. each, the produce from an average of three weeks working for each claim or company. From Ringarooma port to Mount Cameron is an immense marshy, undulating plain, barren and almost treeless in parts for miles; the mount is about 12 miles long and 1800 ft. high, rising abruptly out of a flat country. It runs nearly due east and west, in form triangular, and very rugged, with large masses of granite and sandstone boulders projecting from its sides. The Ringarooma river winds about from the port through the western side of this plain, and then passing through low ranges, runs on the east side of Mount Cameron about 2 miles from the end; its direction then is southerly to the edge of the Upper Ringarooma plateau, along which it winds westerly for some miles, and then southerly and westerly to Mount Maurice, which is the direction of its source.

The tin-bearing country commences a few miles inland from the port, and extends round the base of Mount Cameron, and along both banks of the Ringarooma, till it joins the tin-producing district of Upper Ringarooma. The tin deposits being found in the flats and made hills, as well as in the narrow creeks, very variable and patchy in character; with few exceptions fine for this country, the quartz in the wash-dirt being very waterworn, and the leads of tin ore covered by heavy deposit of soil, varying from 4 to 12 ft. and over in depth. There is a very great resemblance between this and the tin-bearing district of George's Bay.

Starting from Ringarooma Port, and taking the road round the eastern end of Mount Cameron, we will run over the claims in the order in which they are situated. The road for the first few miles over the plain mentioned is hard on the tops of the rises, and wet and boggy in every depression. As the mount is neared the road passes over low, lightly-timbered ranges, creeks, sharp pinches, and very nasty bog-holes. The first section is Douglas and Ward's, six miles from the port; no work has been done yet, except a water race surveyed to deep creek at the foot of Mount Cameron, about half a mile distant. A mile further on is the Sapphire Company's claim, where a small dam has been erected across a narrow gully; wash-dirt was opened out on the hill above, and had to be carted to the water, a rather expensive affair, consequently operations were suspended here some months ago. Crossing a section taken up by Dinham and King we reached the Sextus claim, where work was carried on for some time by Mr. C. Bartley, but operations here are suspended altogether. In the vicinity of the Sextus there are a number of sections applied for by Webb, Ford, and others; and west of them, towards the Mount, are three sections belonging to Smith and Ogilvie, on which good patches of wash-dirt have been found, but it is difficult to get water on to the claim. East of these lie a 20-acre section taken up by John Scott, and adjoining that is the section held by the Mount Cameron Company, and here a good deal of work has been done at a cost of something like 1600*l*. A large dam is erected near the manager's hut, and the workings are on the top of the opposite hill across the gully. As some of the wash-dirt was clayey a puddling machine was erected at the foot of the hill, and a ground sluice cut near it. To convey the wash-dirt a double tramway, nine chains in length, was made from the ground sluice up the hill to the workings, which is worked by a wire rope and drum; from the foot of this tramway is a second one, two chains long, so that the wash-dirt could be put into the sluice-box or puddling machine as required. The wash-dirt on the hill was from 1 to 2 ft. in depth, with from 3 to 4 ft. of stripping; the tin found here is both fine and coarse. Some gold has been extracted from the wash, and work has been suspended on this claim for some months, as it will not pay to work at the present price of tin. On the eastern side of the Cameron Company is the Mount Cameron Extended Company's sections, belonging to Telfer, Smith, and others; about 22 cwts. of tin was got out, but no work is being done on it at present. South and east of this are three sections held by the Ringarooma Company; here a dam was put up, and a puddling machine built, but the wash-dirt was patchey, and operations have been suspended for some time. East and south, and fronting on the Ringarooma river, about two miles from the Mount Cameron Company, are five sections, held by the Enterprise Company; this claim was at one time considered about the best in the district. There is one large dam and several small ones, and a puddling machine erected. The first workings were on a made hill, about 100 yards from the machine, where a very rich patch of wash-dirt was struck, and a good many tons of tin have been taken out. Starting with mere surfacing the stripping deepened up the hill to 6 and 7 ft., the wash running from 6 in. to 2 ft. A great many men were then employed, but operations are nearly ended, one man only being employed. In the vicinity of the last claims mentioned several sections are applied for, but none of them are at work. Next to the Enterprise, on the river frontage, comes one of the Prince of Wales Company's sections. This company's ground runs along the river to the Independent Company.

Returning now to the main road opposite, and west of the Mount Cameron Company, 10 miles from the port, we find a township reserve of 100 acres called Philumena, on which several lots have been surveyed. South and east of the township lies Cornish's sections, on which patches of wash have been found, and 7 tons of tin raised. Proceeding along the road we cross the eastern end of Mount Cameron. Over a spur, about 11 miles from the port, we come upon Degavis's claim of 50 acres, held by the Star of Hope Company. It is situated right under the mountain on a spur, and on the south it adjoins the Prince of Wales Company's works mentioned above. This property was disputed between the two last-mentioned companies, and is now held by the Star of Hope Company, the Prince of Wales having taken out 17 tons of tin during the dispute. The Star of Hope Company have upon this claim the coarsest and most nuggetty tin of any claim in the district. The upper workings are in a blind gully close to the mount, where there is a dam and one box, with six men, but work is often hindered by lack of water. This is just above where the Prince of Wales Company took out the 17 tons of tin: 15 chains below, in the same gully, is another box, where five men are at work. The stripping here is very heavy, about 8 ft.; the average yield is about 20 cwts. per week. This company also holds four 80-acre sections on a flat under the Mount, 3½ miles west from here, and four Chinamen here are employed on the sections known as Gibton's. They have only just commenced work, and have 12 ft. of stripping, besides any amount of water, to contend with. On Degavis's section is a heap of about 100 tons of wash-dirt, that will probably yield over 1½ ton of tin ore. [*To be continued.*]

J. MUFFORD.

### GENERAL BRAZILIAN MINING COMPANY

SIR,—I am glad to find that there is someone interested in the above defunct company beside the liquidator, and if "W. H. C.," who advertised in last week's Journal, will give us a short letter, stating in what way shareholders may expect to benefit themselves, by communicating the particulars asked for by "W. H. C.," he will, doubtless, receive many communications. The writer has not had a line from either liquidator or directors since the company went into "limbo"—I beg pardon—liquidation.

AN AGGRIEVED SHAREHOLDER.

### THE FLAGSTAFF MINING COMPANY.

SIR,—On Sept. 26 the direction of this company in London sent out to the shareholders a circular letter, which I should be glad to have published in connection with this communication, in order that the general public, the shareholders and debenture holders in England, may see at a glance how seriously at variance with the actual facts of the case are the statements and representations made in the circular letter referred to. I would also beg to refer to an address delivered by Mr. Harvey, the Chairman of the company, at the annual meeting held on April 30 at the Cannon-street Hotel, London; also to a circular letter addressed to the shareholders, dated May 9.

The material statements in the circular letter first above mentioned, also in the address of Mr. Harvey, and in the circular letter of May 9, were utterly false. Instead of the debts of the company having been paid and discharged by the said Mr. Hunter, they were kept alive and claimed and alleged by him against the company, and have been assigned by him to Mr. F. W. Billing with his (Mr. Hunter's) lease of the mine, and who now alleges and claims the same against the company. Instead of the South Star and Titus Mines, and the litigation between the owners thereof and the Flagstaff Company, having been bought up, only one-quarter interest therein has been purchased, and the purchasers (that is to say, Messrs. Hunter and Billing) now claim to hold the said interests as against, and not for, the company; and recently a suit between the parties has been tried in the United States District Court here, and a verdict rendered by the jury against the company for $45,000 damage, and should the same be carried into judgment the same will operate an *estoppel* against the company to allege title to the part of the vein heretofore in dispute between it and the owners of the said South Star and Titus Mines. (I enclose herewith a newspaper slip giving an account of the proceedings in this case taken in the Court yesterday.)

The recent extension of the company's tramway is of limited extent, and the whole service to be rendered thereby has hitherto been rendered by mules and wagons at an expense not exceeding $50,000 per annum. Nor is there reason to hope that by the present management the floating debt will be reduced—on the other hand, it has largely increased since Dec. 23, 1876 (when Mr. Hunter took possession), so that Mr. Billing claims an indebtedness to him of $230,000, and there is grave reason to apprehend that the entire properties will be swept away by the debts now so alleged and others which are rapidly being incurred. On or about Sept. 24 Mr. Hunter assigned to Mr. Billing his remaining interest in the lease and the properties, evidences of debts, and liens. On Oct. 31 the United States Marshal issued to Mr. W. S. Mc Cornick, of this city, a deed of the entire Flagstaff property (for particulars of which I beg to refer to my card, published on the 9th inst., enclosed herewith).

Mr. Mathew Reid Sharman (sueing for himself and all other shareholders similarly situated), of Willingborough, England, has filed a complaint against the Flagstaff Silver Mining Company of Utah (Limited), William Charles Harvey, Ellis Pearson, M. C. Vincent, Andrew George Hunter, and Frederick W. Billing, in the United States District Court, from which Bill of Complaint I extract the following specifications:—

This plaintiff and all shareholders not in the interest or under the control of said defendants, or some of them, have until recently been kept by said directory in utter ignorance of the matters pertaining to the affairs of the company, and the prejudicial effect thereof. This plaintiff insists that the said lease was illegal, fraudulent, and void, as well as to said Billing as the said Hunter, and charges that at the times of their several dealings, hereinbefore stated, the said Billing well knew the facts and circumstances invalidating the same. The plaintiff now here insists that all the singular the papers, writings, and dealings between the said Hunter and the directors of the said company—that is to say, the said lease, refining contract, and power of attorney, dated Nov. 24, 1876, and the settlement and adjustment of his claims in July last past, and as well, also, the papers, writings, and dealings between the said Pearson and Billing, made and had in July and September last past, and also the papers, writings, and dealings between the said Pearson and Billing, and the appointments and powers of the said Pearson, Harvey, and Vincent, and also the mortgage pretended to have been made by the said Hunter, dated Dec. 22, 1876, were and each thereof were utterly null and void as against the said company, not only because the same were induced, made, and had with an understanding and agreement that the said directors, or some of them, should have an interest therein, and the profits to arise therefrom, to the great prejudice of the company and its shareholders, but also because the same were beyond the competency of the direction to make or enter into the same, and especially as it was beyond the competency of the said Harvey, Pearson, and Vincent to vest in themselves the powers of the direction, and exercise them in this country, and also to vest in the said Hunter power to make the said mortgage or contract debts, or themselves to recognise or affirm or pay any indebtedness contracted by him, the borrowing powers of the direction having previously been exhausted.

The said Hunter and Billing allege and pretend that the said Hunter bought the one-fourth interest in the said South Star and Titus Mines, and the said liens, judgments, and certificates of sale thereof, and on the properties of the said Flagstaff Company, with his own money, but this plaintiff insists that the money with which the same were made was by said Hunter withdrawn from the company's treasury, and could be said Hunter's only by claiming the same to be his earnings and profits, derived to him from said refining contract and said lease, which, being utterly void, the said moneys were and should be held to be the moneys of the said company.

Since Dec. 23, 1876, ores of the market value of $275,000 and over have been by said defendants, Hunter and Billing, raised and extracted from said mines, and the company should have realised therefrom $150,000 over and above all expenses of mining, marketing, and superintendence. Yet the whole thereof has been lost to the company, and appropriated by the defendants herein to their own use, and the company's debts have not been reduced, but on the other hand have been largely increased, and the mines of the company are being rapidly exhausted, and its property depreciated. Neither of the said defendants, Hunter, Billing, Pearson, Harvey, or Vincent, are able to answer to the company for the damages which it and its shareholders have sustained and will sustain from their misfeances, and corrupt, fraudulent, and illegal practices aforesaid. The plaintiff on his own behalf, and on behalf of all other shareholders of said company, prays judgment:—

1.—That accounts be taken under direction of the Court of all dealings and transactions of the said Hunter and Billing in respect of the properties, affairs, and business of the said company.

2.—That it be declared that the said indenture of lease, the said refining contract, and the power of attorney, all dated Nov. 24, 1876, the mortgage dated Dec. 22, 1876, the power of attorney to said Harvey, Pearson, and Vincent, the contracts between said Hunter and Billing, dated July 11, 1877, and between said Pearson and Billing, and all dealings between said parties, either on their own behalf or on behalf of said company, and the assignment from said Hunter to said Billing in September, 1877, are utterly null and void, and that all debts contracted by them, or any of them, or claimed or alleged by them, or any of them, against said company are, and each thereof is not binding upon said company.

3.—That it be also declared that all moneys received or claimed by the said Hunter, Billing, Harvey, Pearson, and Vincent, or either of them, by reason of any dealings upon the faith or under the authority of all or any, or either of the writings hereinbefore mentioned, are the moneys of said company, to be accounted for to it by the party or parties receiving the same.

4.—That it also be declared that all and every the judgments, liens, claims, certificates of sale, hereinbefore mentioned, were taken by said Hunter, and are held by said Billing for said company, and that the title to the said South Star and Titus Mines, or any interest therein, taken by said Hunter, and by him conveyed to said Billing, was taken and is held in trust for said company.

5.—That the defendants, and each of every of them, be decreed to pay to said company all sums of money belonging to it which have come to their hands.

6.—That the said Hunter, Billing, and any other defendant holding any thereof be decreed to deliver up and assign all and every the judgments, liens, claims, debts, certificates of sale, and choses in action, and also to convey to said company all mines and properties, including the Flagstaff, Last Chance, South Star and Titus Mines and properties, which they, or either of them, have come in possession of by reason of the matters in this complaint alleged.

7.—That the indenture of lease, powers of attorney, and agreement in the second clause of this prayer referred to, be delivered up to be cancelled, and that it be decreed that they be cancelled, set aside, and held for naught.

8.—That the defendants and each of them be enjoined from selling, assigning, transferring, or in any manner intermeddling with or taking deeds upon or under all and every of the above-named writings, judgments, debts, certificates of sale, powers of attorney, agreements, mines, interests in mines, or any other matter or thing herein claimed for said company.

9.—That a receiver be appointed with the usual powers of receivers in such cases, of all the matters and properties mentioned and referred to in the last above clause hereof, and particularly of all the property, rights, interests, mines and claims of said company.

10.—That said plaintiff have his costs of this suit.

11.—That the plaintiff and all other shareholders of the company have all such other and further relief as the circumstances require, and as is agreeable to equity.

You were kind enough to refer editorially, in the *Mining Journal* of Oct. 27, to my discussion with John R. McBride, the Flagstaff Company's attorney, residing in this city, and to express the belief that, judging by the old rule that he who has the worst of the argument first loses his temper, Judge McBride must certainly be declared to be in the wrong. The rule holds good in the present case, and the general verdict of the community is against the irascible judge, especially since it has become generally known that all my charges were well founded, and fully sustained by subsequent development. The firm of Robertson and McBride, the law firm of which Judge McBride is a member, attorneys of the company, who hold a judgment against it for the sum of $10,000, confessed in advance by Hunter when they entered upon their duties in December last—and which they afterwards sold and assigned to Hunter—have taken out an execution on said judgment, and have advertised the Flagstaff Mine and properties for sale thereunder, to take place on 27th inst., by the United States Marshal, and which mine and properties will be bid off at the sale, no doubt, by Hunter or someone in his interest, in order to strengthen the titles which they have heretofore acquired in a similar manner, and adverse to the rights of the Flagstaff Company.

Should any of your friends desire any information in respect of the

Flagstaff Company's affairs here that I can furnish them, I shall take pleasure in doing so, in reply to their enquiries, addressed to me in this city. LYCURGUS EDGERTON.

*Townsend House, Salt Lake City, Utah, Dec.* 13.

## FLAGSTAFF MINING COMPANY.

SIR,—Unless some immediate remedy be found there can be no doubt that the Flagstaff will speedily be, like the Emma, a litigation company instead of a mining company, and add another case of loss to English shareholders and injury to American mining; but happily the remedy appears very simple, for the local creditors seem quite willing to combine with the *bona fide* shareholders upon the conviction that their claims are certain to be satisfied if only the mine be worked. But with the existing boards—that is, with the Harvey-Pearson and with the Garne-Vincent parties—they will have nothing to do. If, therefore, the interests of the shareholders are worth protecting an entirely new and independent board of directors must be appointed, and prompt action must be taken.

The Salt Lake papers recently received leave no doubt as to the London Flagstaff Company having lost possession of the property, or, to be plainer, they have now no mine whatever. But the creditors being friendly, and being undesirous of taking any advantage of the company provided only that their claims be secured, the property may yet be recovered. To this end a meeting should at once be called, and Messrs. Harvey, Vincent, Garne, and Pearson should retire from the board without any nonsense or equivocation, and business men should be elected who are in no way connected with Utah, and have not been in Utah as representatives of the company. As the property is already lost, and cannot be regained while the gentlemen mentioned are directors, they have nothing to lose by retiring, and as they hold a large number of shares, have much to gain from the pacification of the creditors, and the recovery of the property.

That the Cottonwoods district is promising as a mining field seems certain, and it would be indeed unfortunate if, in addition to losing the Emma the Flagstaff should also be lost to the English capitalists. In saying this I do not intend to hold out any exaggerated hopes, but I do say that when a mine has been acquired, upon however unfavourable terms it may have been purchased, or whatever deception may have been practised in the transfer, it is better to work it and get as much profit as possible out of it than to waste time and money in quarrelling, and lose the property. Let a meeting be called, let the past disputes and fighting be forgotten, and let the Flagstaff Mine be recovered and worked, and, perhaps, all may yet be well.—*City, Jan.* 1. HOPEFUL.

## FLAGSTAFF MINING COMPANY.

SIR,—I have noticed with much regret and surprise the publication in your last week's Journal of a letter from Mr. J. H. Beatty to the directors of the Flagstaff Mining Company, which shows plainly from its very nature that it should, in all honour and fairness, have been held perfectly secret and private, the more especially so as no possible good could result to the shareholders by giving it publicity as a whole.

The putting of the latter portion of the letter referred to in print could only tend, as must be apparent, to create trouble in Utah between the company's manager and lessee. How long is a majority to control the Flagstaff Board who will not even stick at such conduct as this? AN OLD SHAREHOLDER.

## WHITE CLIFF MINING COMPANY.

SIR,—In reply to a letter in last week's Journal, signed H. C. Parkes, I am able to state that the above company have the whole of their splendid machinery (made by Mr. Green, Aberystwith) in full work, and the surface arrangements are systematically disposed, making the White Cliff a model mine, in my opinion, for that district. The lodes are very valuable, improving as they are worked, and in a very short time it is expected the company will appear in the Dividend List. The officials have no desire to rush into print and puff up their property, which is totally unconnected with stock-brokers, and the shareholders, nearly all of whom reside in the neighbourhood of Birmingham, can obtain any desired information direct from the secretary. I have been informed to-day of a further sale of 20 tons of ore, the result of a few weeks' work, and I unhesitatingly endorse the opinion of Mr. Parkes that the shareholders possess a valuable property, the proof of which will soon be made apparent. I think the directors of some mines might profitably imitate those of the White Cliff in trusting less to the flowery reports of their captains, and if business-like capacity were made the test of a director's qualification the shareholders would be less likely to see their investments in liquidation. I am an unfortunate shareholder in two mines (in liquidation) brought to their present low ebb chiefly from the radical defect of having "gentlemen" directors, who satisfied themselves that they did their duty when they received the regular reports which the captain thought fit to send, instead of paying constant visits to the mines and satisfying themselves that they were properly managed. The White Cliff shareholders may congratulate themselves on having a body of good working directors, and a most efficient managing director; and the energy, assiduity and skill which characterise the management of this mine will assuredly secure an appropriate reward.

*Birmingham, Jan.* 2. WHITE CLIFF.

## TRIAL OF ROCK-DRILLING MACHINERY.

SIR,—I have read with interest the correspondence in the Journal on the subject of rock-drills, the more especially as my practice during the last few years has frequently brought before me the question of how to get rock cheaply, and I should have been content to leave the interested parties to fight their own battles had it not been for a letter in last week's Journal written by Mr. H. Waddington, whose experience of a trial of Dunn's rock-drills at the Atlas Works, Harrow-road, differs very essentially from my own. Last spring I saw one of these drills at work in the well-known Bardon Quarries, in Leicestershire, the power being steam supplied from a boiler at a considerable distance. The drill worked well (in a deep shot 15 feet or thereabout), and the foreman told me that they were doing much better work with it than with other drills in the quarries; at the same time it was evident that the loss of force, owing to the long lead of steam pipe, and the escape of steam at the drill, rendered such a system inadmissable for underground work. A few weeks since I happened to hear at a board meeting of a mining company that a trial was to be made of some of the same drills worked by Sturgeon's compressors, and I expressed a desire to be present, asking leave to invite one or two other engineers. I received a courteous reply from the manager of the company, with *carte blanche* as to invitations, and attended the trial, accompanied by a friend who assisted me in my observations and measurements, which necessitated at times two recorders.

The pressure in the Sturgeon's compressor was indicated on a dial-guage which we noted every 30 seconds. The man in charge was instructed to keep the pressure at 35 lbs. per square inch, and this he did with great regularity by means of the escape-valve, his only difficulty being to prevent the pressure rising too high. I find the mean pressure at the trial in the Bardon granite was 35¼ lbs. per square inch, and there is no doubt that had a self-acting escape-valve adjusted to 35 lbs. been attached to the compressor the results would have been even better than they were from the greater regularity of action thus ensured. The objection urged by Mr. Waddington as to the granite breaking off the lower side of the millstone was taken into consideration, but instead of guessing, as he seems to have done, we measured the pieces thus broken off, and this I observe has been taken into account in the notice of the trial in the Railway Record of December 8, where the actual length of the bore-hole through the millstone is given at 11 in. only. Mr. Waddington evidently did not measure the depth of the millstone or he would have at once seen that this breakage had been allowed for. A further reference to my notes I find that the amounts bored as given in your impartial account of the trial are rather under the mark, both in the Scotch and Bardon granites; the former is, of course, one of the softer felspathic granites, the latter the toughest I know. I only trust that this letter may call forth some further independent evidence as to the actual and comparative working power of rock-drills; what engineers and mineowners want to see is the record of facts, not the mutual disparagement of interested parties.

*Dec.* 27. GEORGE KILGOUR, M.I.C.E.

## ROCK DRILLS.

SIR,—I should not again have trespassed on your space by answering Messrs. Le Gros, Mayne, Leaver, and Co., had not a mistake arisen in the name of the quarry in Belgium where the trial of the drills had taken place. Instead of Quenast it should be the Charbonnages du Levant du Flénu, at Cuesmes, near Mons. I again repeat that our drill was the only drill bought by the company where the trials took place up to the time the Dunn left, in November. As to the drills at Bardon Hill, the proprietors had three Ingersoll drills at work before they tried our drill, and after three months' trial gave us a testimonial saying—"We give yours the decided preference, and shall be happy to show it to any of your friends at any time." B. L. ATWOOD, Sec.

Dunn's Patent Rock Drill Company (Limited), Goswell-road, E.C.

*London, Jan.* 3.

## ROCK DRILLS.

SIR,—We have read with considerable interest the letters published in the Journal for some weeks past. In reply to the challenge of Messrs. Le Gros, Mayne, Leaver, and Co., contained in your issue of Dec. 22, to run one of the Ingersoll drills against the drill of any other maker, we beg to state that we are prepared to accept the challenge, and to run the Roanhead drill against the Ingersoll in such mine and upon such terms as may be agreed upon.

SALMON, BARNES, AND CO.

*Canal Head Foundry and Engineering Works, Ulverston, Jan.* 3.

## BEAUMONT AND FOSTER DRILL.

SIR,—In driving the Maesteg Tunnel in soft rock four large boring machines were simultaneously employed. The face was perforated with from 16 to 18 holes, each hole 3½ to 4 ft. deep; time of boring about four hours. The average weight of dynamite consumed per "advance" was 20 lbs., or (say) 1 1-10th lb. per hole. The number of men employed 26, sometimes 27. The machine speed 18 yards, hand speed 3½ yards per week. The machine cost, exclusive of interest on capital and depreciation of machinery, is alleged to have been about the same as hand cost. The machine speed is also stated to have been "five and a-half" times that of manual labour. Now, this part of the statement appears to me to be incorrect, or if not altogether incorrect to require correction, as well as similar statements relative to the comparative rate of speed obtained at Carn Brea. A hand-driven level $7 \times 5 \times 3$ will give 105 cubic feet of ground. The Maesteg level $8 \times 8 \times 3$ gave 192 cubic feet of ground, being in the proportion of 1·58 to 1. Suppose the 27 men connected with the machines in one heading had been divided into three pares to drive three headings in the same ground, it would follow that the aggregate length driven would amount to $(3 \times 3\frac{1}{2})$ 10 yards weekly. The machine speed 18 yards weekly is, therefore, *not* 5½ times greater, it is only 1 8-10th time greater than that of hand labour, not an astonishing result when the case is properly stated. DELTA.

## MINING AND BORING MACHINES.

SIR,—I have read with great interest the practical remarks on Mining and Boring Machines contained in the admirable series of lectures, as delivered at the German Clausthal Mining School, which you are regularly publishing in the Journal. The talented lecturer's appreciation of boring machines or drills agrees very considerably with our own. He remarks that the Darlington drill "is the simplest yet brought out." Simplicity is the essence of value. We may soon see the merits of this machine duly appreciated, when the results of its working at Balacorkish and Minera are fully before the public. It is inexpensive in repairs—in fact, the absence for a long period of any repairs at all cannot fail to commend it as the most durable, effectual, and economical drill in existence. Your correspondent does not appear to know that the turning-bar and rachet-wheel, all but universally employed by drill makers, was patented by Messrs. Jordan and Darlington about 14 years ago. Another adoption of Mr. Darlington's design is largely brought before the public in last Saturday's Journal—the conversion of the cylinder into a screw, which Mr. Darlington registered at the Patent Office on Oct. 19, 1876, whereas the patent of the copy was registered on May 19, 1877, by Messrs. Winchester and Flagler. If we are not mistaken Mr. Darlington's drill itself was copied and made in America within a few months of its being patented in this country; it, therefore, behoves parties intending to buy or use drills that they do not infringe the rights of others. We are glad to see that the moderate price at which these drills can be obtained is another great recommendation, and cannot fail to commend themselves to all disinterested patrons of drills. X.

*Dec.* 31.

## AIR-COMPRESSING MACHINERY.

SIR,—In the Journal of Dec. 22 we notice a reply from "A. H." to our invitation desiring him to appoint a day in which he could see our Patent Reliance Air-Compressor at work, and to judge for himself as to the truthfulness of your correspondent's statement in regard to the trial at Messrs. Western and Co.'s Works, Belvedere-road, Lambeth, which statement he has been good enough to call "misleading," without first having proved it to be so. We now tell "A. H." in plain words that he errs simply from want of knowledge of the subject, and once more invite him to come and see the compressor at work, and test it in any way he may think proper. Instead of seeing 90 lbs. of air with 40 lbs. of steam, we will show him a pressure of from 120 lbs. to 150 lbs. of air, with 40 to 45 lbs. of steam, We think this alone should exonerate your correspondent, whoever he may be, from the charge of "misleading." We do not decry any other compressor, but simply place unvarnished facts before the world, and invite all who are in any way interested in such machinery to come and see for themselves what cannot possibly be so well described as the actual working of the machine can give. By giving a general invitation to all it must be obviously very clear that we neither "beg the question," as "A. H." would have your readers believe, or "hide our candles under a bushel," to prevent the world from seeing whether our statements are correct or not. As the columns of the Journal can be utilised far more beneficially than by asking theoretical questions, we trust "A. H." will favour us with a call at his convenience, and we have no doubt but that he will be very well satisfied with the result. As we do not approve of writing letters in journals which lead to nothing, we beg to intimate that this will be our last on this subject.

*London, Jan.* 1. HATHORN AND CO.

## ELECTRIC LIGHTING.

SIR,—The subject of electric illumination is one which has periodically cropped up in the columns of the Journal for the last 25 years, and there are probably few things upon which more money has been lost, but from Mr. Vassard's account of the Nollet-Van-Malderen system the only real obstacle to success appears to be in a fair way of being overcome. These electric candles of which he speaks are evidently a step in the right direction, and the sole question is as to how far this subdivision of a single current can be carried. For ordinary industrial purposes a 15-candle light is more than ample, so that if the 700 candle burner used as a comparison by Mr. Vassard be the smallest producible, it follows that, even theoretically, an electric candle would only be applicable where six men can work around one light. But as a matter of fact all lights of the character of electric and lime lights throw a dangerously dead shadow, to counteract which it is necessary (unless in exceptional cases) to place the electric or lime lights as closely together as ordinary argand or bats-wing gas-burners; hence the six men mentioned would require two electric candles, and as these would have to be kept constantly burning (or at least the electricity must be continually generated and go to waste whether six or only one man be using the light) there would really be no save as compared with coal gas, and the character of light has really very little to recommend it, since it is even more fatiguing to the eyes than gas.

My statement is, indeed, borne out by one fact mentioned by Mr. Vassard. I presume Mr. Vassard refers to the large halls where the passenger luggage is examined at the Paris station, and if so a more favourable place for the electric light could not be found. Taking the halls at 200 ft. by 80 ft., they must be fully 40 ft. high, so that a couple of electric lamps judiciously placed would, of course, shed a fair light, and prevent objectionable shadow. Mr. Vassard states that they have two lamps, and we may assume that they are well placed. I do not know the interior of the Figaro offices, but if the dimensions were given it would be much easier to form an opinion as to whether economy is probable; but I quite admit that if the new invention at all corresponds with Mr. Vassard's description of it, the replacement of gas by electricity wherever a large (Mr. Vassard has obviously used "certain" in the French sense here) quantity of light is required. With regard, however, to the figures from which Mr. Vassard draws his conclusion that magneto-electricity is cheaper than anything else as a source of light, I deny their accuracy; they are doubtful for France, for England they are absolutely wrong. Taking only one example—he makes the mineral oil light to cost three-fifths as much as the colza oil light; it would be much nearer one-fifth, even if he burnt the mineral oil in a Silber lamp, which is decidedly the least economic, light for light, than any of the modern lamps.

That electricity has an advantage over gas in not being liable to explosion I admit, but against this there is an infinitely greater disadvantage of its suddenly ceasing to give light at all. Even the best lamps of Serrin and of Jablochski are liable to these little eccentricities unless extreme care be used in their manipulation, and much absolute loss, as well as inconvenience, would result from throwing an entire factory idle for an hour or two at a time, perhaps when the completion of the work in hand is imperatively necessary. Under these circumstances the substitution of electricity for gas in factories where 350 burners are required would be, to say the least, a hazardous proceeding, whilst to make the substitution where less than 350 burners are used would not be economic.

*Paris, Dec.* 31. ENGLISHMAN.

## ELECTRIC LIGHTING.—No. VI.

SIR,—Having described the system of lighting with "regulators," of which the defects have been shown, and the system of lighting with "candles," with its merits, attention can now be called to the sources of the electricity itself.

DIFFERENCES BETWEEN THE DIVERS APPARATUSES FOR PRODUCING ELECTRICITY.—The principal sources of electricity are: 1.—Batteries with liquids. 2.—Batteries thermo-electric. 3.—Magneto and dynamo electric apparatuses. Up to now it has always been found impossible to obtain a strong current by means of thermo-electric batteries, and amongst the batteries with liquids Bunsen's has almost been the only one employed with a view to electric lighting.

BATTERIES.—Bunsen's batteries coupled in "tension" and in great numbers give a strength of current sufficiently regular to produce a good light, but batteries can only go on for four hours. Their keep is very expensive, and the starting a manipulation of acids rather long and dangerous. Besides, when acting, these batteries give off some dangerous vapours, not only to health but also to all that may be within their reach. As said above, it was only after the invention of the magneto and dynamo electric apparatuses that a serious application of the electric light with a fair chance of success could be thought of.

MACHINES, MAGNETO AND DYNAMO ELECTRIC.—In giving a rapid description of the different kinds of these apparatuses some well-known facts may have to be repeated; yet, as by recent experiments these facts were, so to say, cross-examined very closely, and were proved correct, it may prove useful to repeat them. All these apparatuses can be divided into two classes: 1.—Those giving continuous currents. 2.—Those giving alternate currents. In the first series are ranged the apparatuses known as Ladd's, Siemens', Gramme's; and in the second, Siemens' (primitive), Wilde (giving at will continuous or alternate currents), Nollet (Van Malderen), Lontin.

LADD'S APPARATUS.—Ladd by his apparatus, which is one of the first in which magnetisation has been produced by revolving coils, has rendered the signal service of demonstrating that in order to magnetise electro-magnets it was not necessary to have recourse to an auxiliary source of electricity, but it had the great drawback of quickly heating the coils, and in apparatuses of great power of burning them and its inductor.

SIEMENS'.—This apparatus is very compact, occupies less space, and costs less than Gramme's; does not heat its coils nor its electro-magnets, but after a certain time it gives a spark of certain force in its collector, which is similar to Gramme's.

GRAMME'S.—Gramme's apparatus is a happy improvement on Ladd's. It gives a current of considerable force, though it takes but very little space. This apparatus is very well known in France, but in spite of its many qualities there is much to be desired. The inventor had a very ingenious idea in lessening the diameter of the rings, and in placing metallic brushes as collectors, thus preventing the real collector from being worn out so quickly as in Siemens'; but yet after a few hours of action the apparatus gets very warm, especially the electro-magnets, thereby the current becomes irregular, the magnetisation of the electro-magnets getting disturbed. Moreover, in the type of this apparatus usually supplied, the ring, the electro-magnets, and the focus of light are in the same circle. The resistance of the focus and the currents react on all the system. As the resistance of the voltaic arc in the regulator is always variable, the change in the strength of the resistance increases or decreases the strength of the electro-magnets; then a variation of the motive power required by the apparatus is equally the result. For this reason if the motive power is not at least equal to 4-horse power it is difficult to have the apparatus working regularly. The speed necessary to a good march—800 to 900 revolutions per minute—is also a drawback to practice.

SECOND CLASS—SIEMENS' (primitive type).—This apparatus in order to give alternate currents was originally provided with magnets. The alternate currents' direction is not effected with sufficient ease and quickness, and thereby the light produced was by flashes.

WILDE'S.—This is composed of two parts: one consists in a little machine with reversible currents magnetising the electro-magnets, the other a wire coil producing the alternate current. If that coil does not revolve quick enough the light given out is as heretofore by flashes. To obtain a regular march the apparatus must revolve at nearly 2000 revolutions a minute, a speed often dangerous in practice.

LONTIN'S.—This apparatus is also at alternate currents, but the current is collected not on movable parts but on fixed ones. It can at will be worked in "tension" or in "quantity," and the current can be directed to one or several wires, as in the preceding. In order to magnetise the electro-magnets which revolve and communicate the current to fixed coils, Mr. Lontin added on the same axle another apparatus of his own design, with turned up currents, which he gathers by a system similar to Gramme's and Siemens'. But his collector is more defective than Siemens', and to avoid heating and even fire in that collector it is necessary that a constant stream of water should be running over it all the time it is working. Moreover, the apparatus possesses all the drawbacks of those with turned up currents—that it gives a current of variable force because of the heating of the electro-magnets, and that this current passing through the electro-magnet acting on the coils changes the strength of the magnets, and thereby the intensity of the alternate currents. This apparatus requires 6-horse power to give between 300 and 400 burner-power of light, and acts towards that motive power as Gramme's. It can only revolve one way. In all its parts it heats considerably. The weight of this machine and its dimensions are sensibly equal to—

NOLLET (VAN MALDEREN).—The apparatus Nollet, as perfected by Mr. Van Malderen, is acting with magnets, and gives strong alternate currents. The type generally supplied requires 2½-horse power, does not heat at all, and only goes at 450 revolutions a minute; its march is perfectly regular; it can easily be put to tension or quan-

tity, and can be worked night and day, as shown by several years of application, without attendance, does not get out of order, and once set in place does not need repairs. In action this apparatus does not need a special engineer; its current can be sent on one or on several circuits. Moreover it does not matter which way it revolves; this is a great point, inasmuch as when, with the other systems, once the motion started in a given way, should it by mistake or otherwise be reversed, no current is produced, and the apparatus is deteriorated. Nollet's is very suitable, and generally employed for lighthouses, where a regular light is of first importance. The only drawbacks inherent to it are that it takes more room than others, and that it costs more. However, as far as price is concerned, it may be inferred that with the extension of the electric system of lighting the primary costs will be less, as several will then be made at the same time; already the cost is but a tithe of what it originally was.

*Greenwich, Jan.* 2. ——— A. VASSARD.

## NICKEL, AND NICKEL ORES.

SIR,—Referring to the recent correspondence on this subject, I have for many years used large quantities of nickel, and I think your correspondents must be under a misapprehension as to its present market value. I notice from the printed circular just issued by the leading members of the trade that pure refined nickel is now quoted at 4s. per lb., while inferior qualities have been offered to me at considerably lower prices. It would appear from this that your correspondents are in error, as the price named for nickel contained in 10 per cent. ores is considerably higher than that quoted for pure refined nickel, which can only be extracted from ores of this kind by a complicated and costly process. Will any of your correspondents kindly explain this discrepancy? A CASTER.

## THE BLENDE TRADE.

SIR,—Will any of your readers be kind enough to say if for blende containing 56 per cent. of zinc and 9 ozs. of silver 3*l.* 16s. represents a fair price? It seems to me that the intrinsic value of the zinc is about 12*l.*, and of the silver 2*l.*: total, 14*l.* Can the difference be fairly absorbed by waste and smelters' profits? I anticipate the reply—"The smelters have the rates in their own hands, and can easily combine to keep them down." If so, why cannot miners also combine to keep them up? Cannot money be obtained from banks upon the security of ores at surface? and if ordinary banks be unwilling to lend cannot mining banks be instituted for the purpose? Again, cannot smelting works be erected at a moderate expenditure calculated (say) to smelt from 200 to 500 tons monthly? Would any reader kindly give an idea of approximate cost.—*Devon, Dec.* 31. ——— A. B. C.

## MINING IN WALES—THE LLAN GAN LEAD MINES.

SIR,—On previous occasions you have favoured me by inserting in your valuable Journal the information I have gathered from personal observation in my business relations with mining undertakings in North and South Wales, and through your columns have enabled me to place before the public statements of the position in which I have found them. I have recently been travelling through South Wales, and in the course of my journey have come in contact with the Llan Gan Lead Mines, and, perhaps, a few particulars of their condition and prospects may be read with interest; it may be satisfactory to know of one mine at least that is fast forcing its way to prosperity. In passing through the property I could but notice with interest the spirit in which the work was carried on throughout, and though the company, in common with others, have suffered through the low price of lead and the extremely wet weather they continue to persevere with energy, and through this means have attained a very enviable position. I do not purpose giving a detailed description of the mine and works; it is sufficient to say they have a powerful engine for pumping and hauling, with crushing mill, and the dressing-floors are complete with the most approved apparatus for carrying on an extensive business, and anyone desirous of seeing a compact and thorough going concern will be amply repaid for their trouble by a visit to these mines. Their consignments to market have increased in quantity, and the monthly parcel now assumes goodly proportions, and with their present staff they are keeping up a steady and remunerative production, obtained principally from the workings in one shaft, in which the lodes have continued to improve in yield the further they are driven and sunk on; in other shafts the operations have suffered from the accumulation of water. In the main or engine shaft at a depth of 20 fathoms they have driven two cross-cuts, one north and one south, and in each have intersected the lodes; in meeting with this success, however, in the cross-cut south end the water poured in and increased to such an extent that they gave up all attempts for the present to keep it under, and are only using the engine for supplying the dressing-floors and driving the crushing machine. Preparations are, however, being made for putting in larger lifts, and the engine being a very powerful one it is fully able to clear the workings and keep them free, and at the same time to haul the ore to surface, and meet any emergencies that may occur in sinking the shaft deeper, as they propose doing as early as possible.

By the early spring the management hope to have all improvement and alterations completed, and with more propitious weather for extensive operations it is the intention to develope these mines on a large scale, and no doubt is entertained but every confidence expressed in the certainty of this property becoming one of the safest and most profitable investments of the day. In thanking you for the kind insertion of this letter, I trust my brief outline of the Llan Gan Lead Mines may be of interest to the public.

*Cardiff, Jan.* 1. ——— A TRAVELLER.

## THE GREAT DISCOVERY OF LEAD ORE NEAR RHAYADER.

SIR,—In the Journal of Dec. 22 I read another of Mr. Evans's epistles in reference to the above discovery, in which his 200 fms. had dwindled down to 100 fms. and 3 ft. I hope his interested friends will be grateful for the 3 ft. Allow me to urgently request Mr. Arthur Evans to take a stroll once more, accompanied by his tape of course. But the next time Mr. Evans may find that what is now only 100 fms. will come down to considerably less than half again. Such writers on this Rhayader discovery seem to have forgotten that truth has a far higher standard of value than fine gold; how much more so than fine lead, even 200 fms. long of it, especially so when those 200 fms. do not really exist. Mr. Absalom Francis very wisely remarks in last week's Journal that it seems strange with such a gigantic discovery "nothing should be done." It is passing strange that nothing should be done beyond looking at it. In my communication to Mr. Harvey I described what are the leading geological features of this country, and now beg to add that there are several traps of a plutonic character heaved up and broken through the clay-slate at different points in the district. There are several magnificent lodes in the district of Rhayader (and we will give that a circumference of 10 or 12 miles), and I have no hesitation in saying that I myself could point out some of as fine lodes as any ever found in Wales or any other part of the United Kingdom—that is, judging from the rich gossans and other indications to be seen on the backs of these lodes—passing through some of the finest valleys and hills, with abundance of water in all directions. Looking at the geological, geographical, and mineralogical features of the whole district everyone that has a sound knowledge of these matters will at once be impressed that there must be a noble mining future for the district of Rhayader. Therefore there is not the slightest need for those most interested to write such exaggerated reports of 200 fms. long; the only thing such reports can serve is to cause men of capital to look with suspicion upon the whole district. I would also call the attention of your readers to the fact of there being several very fine slate veins in the district. There are, I believe, three new and small slate quarries on the property of Mr. Lewis Lloyd; they are now being worked for roofing slate, and with facility; the slates are fully equal to the best North Wales slates. Another feature which speaks highly for the future prosperity of the district (reverting again to the Nant-y-Car business, I find "E. S. G.," in last week's Journal, complains that all your correspondents should ignore Conway), in my letter to Mr. Harvey I called particular attention to the fact of Conway having made a very rich discovery of lead ore near Nant-y-Car, and I must say that, as a reward for his discovery, it is much to be regretted he did not succeed in obtaining the tacknote. He, of all others, undoubtedly had in all fairness the first claim, but it cannot be the fault of the lord of the manor of Builth, who is a most honourable gentleman.—*Jan.* 1. ——— CARACTACUS.

## PARYS MOUNTAIN, OR MORFA-DU MINES.

SIR,—Being greatly interested in mining generally in North Wales, I should be much gratified to find this mine coming forward, as, indeed, it is fully believed from the history of the property it ought to do. The 90 cross-cut south must be very near the Mona lodes known to exist in the hill and hourly looked for. A telegram may suddenly announce the cutting of these lodes, and a demand for the shares would quickly double or treble the present quotation. The open-cast, from which such wealth of ore has been taken, of course becomes the great goal for which the company are now striving—to strike this body of ore 35 fms. below the same. The vein of ore found lately in driving the 90 cross-cut, and which is being worked on and already paying its own cost, may lead to a great discovery shortly, thus doubling the chances in this direction—a great advantage. It seems rank folly not to work this great white-rock formation by a drivage from the Morfa-du portion of the sett, and which, undoubtedly, is a continuation of the mass of copper ore found formerly in Parys Mountain. This would make the Morfa-du Mine, with a little capital of 7000*l.* or so, one of the wealthiest properties in Wales, without exception. Of course, the interesting extraction of blue stone is not taken into consideration. This company ought also to be in a position to discover what underlies the blue stone lode ere many weeks, the shaft already being in progress of further sinking. To my mind no properties give better promise of becoming great prizes for the coming year of 1878, and I wish all success to the present proprietary. This would be also a great event for North Wales.—*Wrexham, Jan.* 1. MINING ENGINEER.

## THE BETTWS-Y-COED LEAD MINE.

SIR,—After reading the report of Mr. Halley upon this property in last week's Journal, I have remembered that the mine was worked some years ago by the Carnarvonshire Consolidated Lead Mining Company, under the management of Mr. J. Kitto, M.E. Mr. Halley says in his report that "the lode in the bottom of the deep adit will yield from 15 to 50 cwts. per fathom." Now, as this level was driven about 18 years ago, how did Capt. Kitto leave such a piece of orey ground unworked? which, according to the report of Mr. Halley, ought to produce about 4000 tons of ore, worth 48,000*l.*

*Queen's-road, Liverpool, Dec.* 28. J. MCDONALD.

## MINING IN CARDIGANSHIRE—OLD ESGAIR MWYN.

SIR,—The splendid discovery to which I referred in writing you three weeks ago not only continues the productiveness which I then stated but improves in depth. Seldom has there been seen a finer mass of lead ore than is now in the winze, and there is all the elements that can be desired for ensuring a continuance, and if this proves correct at no very distant day Esgair Mwyn will be able to compete with any mine in the county, both in output and, what is still more important, profit. GEO. GREEN (of Aberystwith).

*Llanrwst, Jan.* 3.

## GREAT WEST VAN.

SIR,—I wish to make a reply to Mr. Ward's letter, in last week's Journal. The liquidator of the Esgair Lle Mine sold the same to the late Mr. Matthew Greene, and no one else, and who alone formed the company. Mr. W. Ward's name appears in the prospectus as broker to the company, and whose name doubtless tended much to the very numerous applications made for the shares. Mr. Ward gave his proxy to Mr. Greene in support of the general meetings, which were represented by a large majority of the company, in declaring the dividende out of revenue, as the new works, shaft sinking, and extra machinery were charged to capital. No one wants the Great West Van Mining Company wound-up, and if the shareholders will find the requisite money on preference shares or 10 per cent. debentures, to bring the mine into a profitable state, is all that is desired. The writer of this and his brother have such confidence in the ultimate success of the undertaking that they will take preference shares or debentures to the extent of 500*l.* or 600*l.*

*Old Broad-street, Jan.* 3 ——— T. GUNDRY.

## NEW CONSOLS.

SIR,—Nearly twelve months have elapsed since the world was surprised by the announcement of the insolvency of this company, and the subsequent appointment of liquidators to wind up its affairs. Up to this date no dividend has been declared, nor any statement issued, so far as I know, of the liabilities and assets of the company, and yet I find that nearly all the effects, except the machinery, have been sold. When the mine ceased to work it was supposed that arrangements would be made with the creditors, and that thereupon the working would be resumed, but I have lately heard that there is no prospect of resumption of work, and that very little, if anything, will come into the hands of the creditors. The conduct of the board of directors is open to very severe censure.

*Jan.* 3. ——— A. CREDITOR.

## PROSPECTS OF MINING—THE PENSTRUTHAL COMPANY.

SIR,—It has been said that controversy elicits truth. It will be a happy circumstance if the one now prevailing through the medium of your valuable paper should prove so. Persons and mines are freely named, and it is a remarkable circumstance that most of the mines mentioned are situated within a few hours' ride of London, and we should suppose that investors might ascertain for themselves some facts relative to each property named as to their prospective value, as well as obtain from the executive the true financial position of the respective companies they join. The recommendation of interested parties by circular advising the purchase of shares in any company should be thoroughly considered before a bargain is made. It is, however, possible that persons holding valuable mining stock may be induced to part with their shares by listening to the reports of some who never see a prospect of a good mine in which they are not interested. The criticising any new undertaking in a fair and straightforward manner should be an advantage to all young companies, and would ultimately become a great boon to investors, as well as to all concerned in this great national industry. That capitalists have sustained heavy losses through the present long depression of trade generally, and especially so in the low price of iron, coal, tin, copper, lead, &c., is painfully known. It is also well known that the inflated state of trade immediately succeeding the Franco-German war led to the purchase of properties producing these minerals at prices altogether beyond their relative value.

That a panic should have succeeded is no marvel. Shareholders, however, should not be dismayed, and believe their money hopelessly lost. It may be hoped that the wretched war so long prevailing in this country between capital and labour may soon end, and also that the nations on the Continent of Europe may soon learn that trade and commerce are more profitable than war. Should the Holy Potentate of Russia have had his full draft of human gore and wretchedness of which he has been the author we may hope for some improvement also. There are now we think many valuable properties in which safe and very profitable investments may be made Penstruthal Mining Company, in Cornwall, started with a capital of 100,000*l.*, the promotion being half that amount, was to the astonishment of all who knew the mine launched some years ago. Extravagant management and other sad causes have so far depressed the shares here that they are now being sold at little over one-eighth of the issued price, or a discount of over 80 per cent. The mine is doubtless a good one, and the present directors are gentlemen of known integrity and business capabilities, who are large shareholders, taking no pay for their attentions. The secretary, too, as well as the local management, is now reduced to the lowest minimum of pay for efficient service. We shall be much surprised if these shares are not double their present price during the current year. Many concerns might be named where there is, perhaps, an equal chance of success, and to some of these the writer may in a further letter call attention. Trusting soon to see an improvement in all kinds of business, and that peace and harmony may prevail among all engaged therein, I conclude these lines by wishing you, Sir, and your readers also a Happy New Year. T. VOSPER.

*Finsbury Chambers, Jan.* 2. ———

## OLD TREBURGETT SILVER-LEAD MINE.

SIR,—"An Old Shareholder" having been so thoroughly beaten he has hoisted his flag of truce, so we will, Englishman-like, be honourable, and give him quarter. But we must for the sake of truth emphatically deny the statement made by "An Old Shareholder," as he styles himself, that the lords had treated our offer as "an absurdity," or "unworthy of notice," for since the publication of our first letter nearly 50 men have been employed, instead of six, as before, and in the places we pointed out as being worthy of a trial, the result having enhanced the value of the mine some thousands of pounds at least.

We beg to say that it would have been more to "An Old Shareholder's" credit had he borne in mind that abuse is not argument, and had written a deal less of the former, for all your readers, Mr. Editor, can plainly see on which side the abuse has been, and we can assure him we shall in future treat such a style of writing with silent contempt.

It is not our intention to "wriggle out of it like a serpent," but we are prepared to give further details, and stick to our first proposition; and with the present prospects of the mine, and the economies already mentioned, with some others we might name, we are confident of success.

Doubtless, Mr. Editor, many of your readers are surprised at "An Old Shareholder," as he styles himself, writing in such a manner, abusing the men, and saying they are "conceited" and "discontented" because they wish to be industrious, to procure a livelihood for themselves and families, and to benefit the neighbourhood generally, as well as the proprietors and adventurers of the mine, but they will understand it all when we tell them that he should have signed himself "one of the benefited."

THE MINERS OF OLD TREBURGETT.

*St. Teath, Cornwall, Dec.* 31.

[We regret that the writers of the letters purporting to have emanated from "The Miners of Old Treburgett" should have been so indiscreet and ill advised as to make certain groundless and reprehensible insinuations against the manager. From enquiries which we have made we are quite satisfied that such insinuations have no foundation whatever, and that the unimpeachable character of the gentleman referred to is too well known to the mining community for the objectionable remarks to have any effect. We must now decline to insert any further letters from the "Miners" on the subject, unless duly signed by their representative, and the correspondence must, therefore, be considered as closed.]

## WEST SETON MINE.

SIR,—At a meeting held on Dec. 28 a remarkable incident in mining occurred—the appointment of a committee over the manager's head. It is satisfactory to find, however, that Capt. Josiah Thomas, of Dolcoath, had the manly independence to decline to conform to this capricious bit of petty tyranny, and it is to be hoped that managers of mines generally on the return of better times will assert their independence in a similar manner, and make a firm stand against this wire-pulling on the part of mine-material supplying and share-broking committees. At this meeting Mr. Rule, as is his wont, was the chief spokesman, and gave utterance to some ideas which call for special remark. For example, he intimated that the present earnings of the miner would reach 4*l.* per month instead of 50s., as at present, but for the neglect of the agents. It may be well to enquire what Mr. Rule would be likely to say to the agents of mines in which he is interested if the earnings of the men happened to reach 4*l.* per month? It is well known that as a rule the wages are fixed by "the powers that be," and the agents have to arrange their setting prices accordingly. I do not believe there is a mine agent in the county of Cornwall who would not be glad to see every man earning 4*l.* per month and more, but are they allowed to afford these earnings? Is it the fault of the agents that in a mine in which Mr. Rule is now a shareholder the women on the dressing-floors are paid off with 8d. per day, and that the enginemen are expected to exist on the starving pittance of 45s. per month? The future average gettings of the miners, and the earnings allowed the surface workers at West Seton by the present committee will be observed with no small degree of interest throughout the county.

*Jan.* 3. ——— INDEX.

## LLANRWST LEAD MINE.

SIR,—I did not intend to take any part in the wretched squabble between Messrs. Sharp and others now going on respecting this mine, nor should I if Mr. Granville Sharp had not adverted to me in an unjustifiable manner in last week's Journal. I do not know who the veritable dresser of the neighbouring mine may be who is alleged to have stated that I valued the ores at surface at 400 tons. I have never done so; and care no more for the said dresser than Mr. Sharp. And when he states that the whole of the stuff when dressed amounted to no more than 100 tons, it devolves on me to say that there are hundreds of tons of stuff still undressed, and now in course of dressing, at the surface; and when I state that that 100 tons was taken from a drivage of 50 fms. at the adit, which will not average 20 fms. deep without the aid of stoping, Mr. Sharp may begin to suspect that there is more in Llanrwst than he was wont to give us credit for. We have stoped a little of the back of the adit, but not a great deal, whilst a great deal of the ores broken by this means are still down in the mine. The adit throughout on the caunter lode was best in the bottom, and we have recently intersected it at the 14, under adit, and find it 4 feet wide, orey throughout, a very fine-looking lode, which bids fair to realise all that had been predicted of it. If this lode were all that the mine contained it would be sufficient to set it far above the ordinary level of young mines, but it is not all, and presumably not the best. The main lode, which had been exhausted above the adit by the former workers, and until recently was unavailable below on account of the water, has now been drained to the depth of about 9 fms. under the adit, so as to enable us to sink the diagonal shaft on its course to that depth, at which point the lode is 5 ft. wide, producing 2 tons of lead ore per fathom, accompanied by appearances indicative of greater productiveness on extending the workings. In addition to these we some time since intersected an entirely new lode unexpectedly in the eastern part of the mine, a true caunter, not previously known to be in the sett, and which in all probability will be found a valuable auxiliary to the productiveness of the mine. We have been frequently taunted with the extraordinary period of time that this mine has been in progress, but I think it will be seen by all rational eyes and intellects that although it has attained the ripe age of four years it is still in its infancy, but of more productive and promising advancement than most infants at a similar age.

It may be proper to state here that my action throughout in the management of the mine has been devoted to the interest of the company. I know nothing of individuals or of individual interests in the management of mines, but only a single interest, a unity, a whole. We may have been longer than many persons expected in bringing about results, and I frankly admit that we have been longer than I at first expected, but that has arisen from finding much more to do in making available the ores for returns. So much mundic was found associated with the lead on the caunter lode in the eastern section of the mine that stamps and roasting furnaces were required, and while these are being provided a large accumulation of rich stuff is taking place on the floors. We have not had to make any alteration in our original arrangements, but to supplement them with additional appliances—a necessity from natural changes which could not have been foreseen. It is one thing to find a mine ready made, but quite another thing to make and fully equip one for systematic and economical working, and under difficulties such as are rarely, if ever, encountered in Cornwall. In one case success may

be achieved at a bound, especially when there are large resources of what had previously been an unremunerative, if not absolutely unsaleable, commodity; whilst in the other case success is only attained by constant, patient, and persevering assiduity. I am not afraid that the developments and provisions made by and for the working of the Llanrwst Lead Mine will not bear a favourable comparison with any mine in the kingdom, provided it was made by honest, competent, and unbiassed persons, but others whose animus rises to the boiling point of venom and ungovernable ebullitions of temper and expression would see nothing through the distorted lens of their prejudice but their preconceived objects.

For the edification of Messrs. Sharp I will now state that the Llanrwst Mine is a substantially good one, and that so far as it is at present opened and its future prospects indicated, it cannot, I think, be surpassed by any mine in the Principality at a similar stage of development. I assume nothing in stating that I am as competent to judge of this matter as Messrs. Sharp are, nor that I am as truthful in expression and as honest in intention as either of them.

Mr. Gould Sharp stated in last week's Journal that he had no desire to injure this company. I shall only say in respect of that that his statement and acts do not at all correspond. I think no one that has read, or may read, that letter can come to any other conclusion than that I have expressed. ROBERT KNAPP.

*Llanrwst Mine, Jan.* 1.

## CAPT. JOSEPH VIVIAN.

SIR,—At the annual meeting of the members of the Mining Institute of Cornwall, held on Monday, at Tabb's Hotel, Redruth honourable mention was made by Captain Teague of Capt. J. Vivian, of Camborne. It was resolved, on his motion, that Capt. Vivian be made a life member; but something more valuable, as a testimony to the old gentleman's worth, should be presented to him. No one in Cornwall has worked so many mines as he, nor has anyone conducted himself more honourably in all his transactions with the world. Testimonials, many have been given to far less worthy individuals than Capt. Vivian. I had hoped to see, ere this, the opening of a subscription list in the Camborne district for subscriptions for the purchase of something indicative of the high respect in which he is held there, and, indeed, wherever he is known in England; and also on the Continents of Europe and America, which he visited as an inspector of mines. He and his late brother, Capt. Nicholas Vivian, were noted for the fidelity of their reports. Captain Vivian was for 50 years the manager of North Roskear. He is now 86 years of age, but is able to walk about. If I were resident in the Camborne district I would at once set a subscription on foot. A WAITING SUBSCRIBER.

## HOLMBUSH, AND WHEAL NEWTON.

SIR,—The remarks made by your Cornish correspondent with reference to the above mines, and the comments of one of your contributors thereon, open up a very wide question—how far those in charge of joint-stock companies are justified in noticing demands for information when such demands are preferred by anonymous writers? I am inclined to think that the enquiries of shareholders alone are entitled to replies, and if the affairs of a company be fully communicated and explained to its shareholders from time to time I fail to see the necessity for further publication. In Holmbush and Wheal Newton, for example, full accounts and reports are published at frequent intervals, and the satisfaction of the shareholders may best be judged of by their disinclination to part with any shares except at a considerable premium. In the case of Wheal Newton in particular I may mention that not long ago the balance of 4000 shares at the disposal of the company was bought up by independent shareholders residing in various parts of the country at a premium of 3*l.* per share.

You may reply that "the public" desire information, or at any rate that it is desirable for full information to be published, so that subsequent investors may not be misled. Herein I partly agree with you. As for the "public," indeed this word usually signifies the confraternity of shareholders, mine agents, merchants, lawyers, accountants, and the like, each of whom cries out for information in order that he may use it for his own personal purposes of profit, wrecking, or revenge. To such gentry I hope I shall ever turn a deaf ear. When, however, it becomes a question of *bona fide* investment, then I hold with you that the executive of every company ought to give any desired information, and thus enable both seller and purchaser to form the most accurate opinion possible as to the intrinsic value of the shares in treaty. This is our practice in the Holmbush and Wheal Newton companies, and in addition we furnish the public Press with copies of our weekly reports from the mines, and with intimation of any events of general interest from time to time.

Your contributor asks what ores the above mines have produced, and in what market they have been sold. Now, your own columns a week or two ago contained the details of the Holmbush output from April to December, 1877, and it is not many months since I sent you a detailed statement (which you published) of the silver ores extracted from Wheal Newton, with the prices realised and the names of the purchasers. This shows how little trouble your contributor has taken to make himself acquainted with the facts of the case. Enquiry is laborious; criticism is easy; and the temptation of writing a smart paragraph too often proves stronger than the desire to be accurate and just. I will not impute worse motives in the present case.

So, too, with regard to the dividends paid by Holmbush and Wheal Newton. The amount of profit earned and the amount of capital paid up from time to time have never been witheld; and your contributor had only to search your own files or to apply to me in order to have obtained such information as would have rendered him unable, in any spirit of fairness,

> To hint a doubt and hesitate dislike.

I have had my full share of abuse in certain journals, and occasionally I have amused myself by tracing its origin. In every case, without exception, I have found my shareholders to be actuated by the basest motives, and utterly indifferent to the falsehood of their attacks, knowing that the editors of the journals in question will not scruple to suppress or mutilate my replies. The most recent example of this is worth placing upon record. A week or two ago in the columns of a provincial newspaper there appeared a communication described as from a correspondent, in which some foolish sneers were directed at me with reference to the recent reduction of work (fully reported and explained in the *Mining Journal*) at Holmbush, and it was further insinuated that no accounts of Holmbush had ever been published. There was neither signature nor address to this precious communication; but I have good grounds for attributing it to a local captain whom I refused to engage on account of his intemperance. I wrote to the editor of the newspaper, and pointed out the inaccurate nature of the attack. In due course my letter appeared, but in a mutilated form, the most important and telling sentence having been suppressed. My signature was coolly appended, no editorial explanation was attached, and not even a few asterisks were inserted to show that anything had been deleted. Surely in this case the "freedom" of the Press has degenerated into something worse than license.

I write this from a sick bed, and I am afraid for some time to come the general direction of our undertakings in the Kit-Hill district will fully tax my available strength. If, however, your contributor will declare his real name and address, I will do my best to break as many lances with him as he may desire, but I will have nothing to do with anonymous slanderers.

*Brixton, Jan.* 3. STEPHEN H. EMMENS.

## WHEAL PRUSSIA MINES,

SIR,—When we started Wheal Prussia, in 1873, it was agreed to call up 2*l.* per share, and that amount was entered in your mining columns. It was found, however, that 5*s.* per share was all that was required, consequently the remaining 35*s.* per share was remitted, but I did not take care to have it corrected in your lists as I should have done. Now, will you kindly correct this, and enter Wheal Prussia as 5*s.* per share paid up only; quoted price 6½ to 7. Notwithstanding the strictures of the writer in the City Article columns, Wheal Prussia is destined to play a very important part among Cornish mines. Why, we have 40,000*l.* worth of tin discovered, and could pay monthly as much dividend as was declared for all of last year. If he is not satisfied with Pedn-an-drea he can come and investigate for himself and welcome, for it can well bear investigation. W. TREGAY.

*Redruth, Jan.* 2.

[The return of tin made in 1877 was only a portion of the tin broken that year in drivages and in sinking the shaft. If we estimate the tin already discovered in this mine as worth 40,000*l.* at the present low price we shall then be within the mark. This is within about 60 fms. from surface, and I do not anticipate any difficulty in paying every month a similar dividend to that declared for the whole of the past year. So the ill-advised remarks of anybody will have to go for nothing, as they cannot possibly work any mischief here whatever position they may assume.—W. TREGAY.]

## TYN-Y-FRON MINE—ITS PROSPECTS.

SIR,—In wishing the shareholders of this mine a most prosperous year, as some of them have gone into it on my recommendation of the property, I think it is becoming in me, if not an imperative duty, that they should at the end of the past and the beginning of the present year be informed of the prospects with what is likely to result from it during the next twelve months. The mine stands on the north bank of the River Rheidol, the lodes running with the mountain, and almost parallel with the river throughout this grant, which varies but a very few degrees from east to west. An adit level was taken up from the side of the hill, which after a drivage of 28 fms. 3 ft. reached the main or Tyn-y-Fron lode, which was opened out eastward on its course for 50 fathoms on a rich lode of blende, yielding nearly, if not quite, 3 tons of this ore per fathom, besides good stones of lead and copper ore in places. The best portion of the vein has only been worked away, and I estimate the portion left throughout this drivage, which can be stoped down at a very low cost, will yield from 1 to 1¼ ton per fathom In driving this 50 fathoms east the forebreast has obtained a back or height of 40 fathoms from surface. At this point there is a cross, or rather a caunter lode, which crosses the main lode, about 3 ft. wide, composed of rich copper, gossan, lead, and blende, and it is to this junction with the main lode that I attribute the formation of the great course of ore laid open for 50 fathoms east of the adit cross-cut, as here described, and also west of the same for 30 fathoms, in which direction the lode has opened out equally as rich as in the eastern ground, and where one half of the richest portion of the ore has been taken away, the other half remaining as is the case eastward for being stripped down. It will be necessary here to explain that all the ore broken from the mine has been returned by means of bucking hammers, no machinery of any kind never having been erected on the property. On the caunter lode about 6 fathoms has been opened, from which the old miners drove east for about 20 fathoms, altogether out of the Tyn-y Fron lode—in fact, nothing has yet been seen of the main lode east of its junction with the caunter lode. We endeavoured to trace the caunter lode through the main lode westward, and in this we succeeded. We found where the lode separated from the main lode; it was about 3 ft. wide, and would yield about ¼ ton of lead ore per fathom; we continued to open on this, which continued to improve, and in 2 fathoms from where the lode separated the lode had increased in size to 5 ft., and would yield 1¼ ton of rich lead per fathom. Specimens of this lead are at the office. We are still continuing to open on very rich lead ore at this place. Some little of the very richest portion of the main vein has been stoped under this adit for a fathom or two in depth, but nothing of consequence has been effected. The old men, however, sunk a shaft about 35 fathoms east of the cross-cut about 12 fathoms deep, and in this it is reported, and I firmly believe it, they had a very rich lode both for lead and blende ores, as well as good copper mixed with it.

I have now given an account of what has been done on the main lode, and I will now endeavour to show what has been done on the south lode. About 4 fathoms before reaching the Tyn-y-Fron lode we discovered what we then thought a branch, which the old men had opened on eastward for some little distance. On examining this more closely, however, it was found they had driven on a good lode for blende, which yielded nearly 2 tons per fathom, and that this drivage had been carried on on the south part of the lode, the other portion about 9 ft. wide, being composed of gossan, spar, and sulphur. In order to prove this lode a cross-cut has been driven 25 fathoms west of the adit cross-cut, which intersected (at nearly the same distance as it was found in the adit cross-cut) the lode, of a most favourable description, composed of rich blende, stones of copper and lead ores, sugar, and crystalised quartz and gossan, and yielding of the first-named—blende ore—2 tons per fathom. I have put the men to sink on this for the present, and have no doubt the ore will continue to improve. We have thus seen the south lode rich here in the adit cross-cut 25 fathoms east, whilst at the discovery of lead again, 35 fathomt east of the adit cross-cut, we have only seen the north wall of it, which is found to be very rich in lead ore, or in all 60 fathoms proved rich in ore. But the grand point about this property is that the main lode underlies 2 ft. south in a fathom, whilst the south lode goes down perpendicular, so that these two great lodes, both containing rich courses of ore at the adit, at about 10 fathoms under the adit will unite and form a junction, and where I have no doubt whatever that a course of ore so rich will be found that it will enhance the value of the shares when this point is reached in all probability 1000 per cent. on their now market value. I have never seen such a junction miss in producing immense masses of ore, and I feel confident we shall not be wrong in taking this for granted here.

*Goginan, Jan.* 1. ABSALOM FRANCIS.

## A REVIEW OF TRADE AND FINANCE DURING 1877.

SIR,—The year 1877 has passed away without any such improvement in business as was hoped for by all at its commencement, but which many experienced persons feared would not come to pass. There are in some branches tokens of revival, notably in the metal markets, such as tin, lead, and copper, and in that department of the iron trade which is called tin-plates, from the iron plates being lined with tin. But the manufacture of iron and the sale of pig and articles of iron requiring most skilled labour are still exceedingly depressed, mainly in consequence of the Belgians and Germans, and even the French, competing successfully with us in design and the artistic execution of it. But in Italy, where both France and Belgium had gained the ascendancy in iron and steel rails, English exporters are once more successful, but this import by Italy from other parts of Europe has greatly declined. Belgium is, however, a formidable rival for iron in the Chinese market, where it was supposed we should nearly have a monopoly. The general course of trade has not been profitable, but has not decreased much as to exports in quantity; the falling off in value is considerable. Our imports have increased beyond precedent, and as these partly represent profits, advances repaid, interest on foreign loans, &c., the increase is matter for congratulation. The revenue has proved satisfactory, but our expenditure, especially for military purposes, has augmented. The Poor Law report shows that pauperism has declined. The main cause of such depression in commerce as existed was the agitated state of foreign countries. The war between Turkey and Russia was the leading occasion of dull trade. The long-continued conflict of parties in France paralysed business there, and as that is the richest commercial country in the world (except England) we suffered in consequence of the decline of its prosperity. It has been affirmed that not one branch of trade escaped the depression in France, even the silk manufacturers of Marseilles and Lyons, for which France has obtained so much celebrity and wealth, was almost destroyed, and those two cities consigned to an amount of suffering greater than in Lancashire and Cheshire during the cotton famine. The existing jealousies and rivalries in the United States between the Republicans and Democrats threaten the revival of old animosities, embarrass the policy of the President, impair public confidence in the future financial policy of the Union, and necessarily impede commerce.

The state of business in England has been altogether abnormal—plenty of money, and dull trade. On former occasions when trade was bad money was scarce, but the present phenomena, as far as we know, never before presented themselves. Some years ago it appeared as if the British people were under a necessity, not knowing what to do with their money, to solicit all the world to borrow it. This was far from being the case; numerous avenues of investment were open at home, profitable enterprises were impeded or at a stand for want of capital, and many undertakings which were absolutely remunerative had to be given up from this cause, while every State in both hemispheres—most of them since bankrupt—received loans readily from English capitalists. In the result the failure of these States to pay provoked English investors, suffering from their losses, to realise and keep their money under their own control; hence the want of enterprise so evident at the present time, and the redundance of capital. There have been very few joint stock companies registered during this year, and of this few all have not been brought to maturity. This brings us naturally to the consideration of the rate of interest for money during the year. It opened with a Bank of England minimum of 2 per cent, and that rate was maintained for four months, when, the proportion of reserves to liabilities declining, the minimum was set up to 3 per cent., at which it remained for two months, but the outside market ruled much lower, and it was deemed politic in Threadneedle-street to recede to 2½, which decline, not sufficing to bring discount to the Bank, the minimum was put down in a week to 2 per cent., at which it remained two months. Gold having meantime left the Bank for Germany the official rate was raised to 3 per cent., at which it continued for five weeks. At the beginning of October, in consequence of the drain for Germany, the Bank sliding scale went up to 5 per cent., and that rate was maintained to the end of November, when it was moved down to 4 per cent.

The highest point of the bullion treasured in the Bank vaults was in January, for the Bank was in every respect stronger at the opening of the year than at the close. The January return averaged 28,215,165*l.* The lowest stock of bullion in the Bank occurred in November—22,278,857*l.* That necessitated a 5 per cent., at all events in conjunction with the lower proportion of reserve to liabilities. The highest reserve was 14,048,335*l.*, and the lowest 9,431,126*l.* The proportion of reserve to liabilities which showed the greatest strength of the establishment was 48½—nearly the highest rate deemed by political economists compatible with sound banking. The lowest was 35·48., about 2 per cent. higher than the lowest to which financiers are of opinion it should ever be permitted to descend. The highest issue was in January, which was 28,622,775*l.*, and the lowest was about 26,000,000*l.*

The returns of the Clearing House indicate pretty accurately the course of trade on July 11, they being the enormous amount of 125¼ millions, but in September, when trade was very depressed, they fell to 71¼ millions. The gold imported was 15 millions (using round numbers), against over 23 millions last year. The amount sent away was 20 millions, against 14 millions in 1876, which will, of course, account for its progress from extreme cheapness to comparative dearness throughout the year. Germany took home about 8 millions, France 6 millions, Egypt 1¼ million, and the United States 1 million. These withdrawals had a depressing tendency on our commerce for tin, copper, lead, and zinc; but, nevertheless, the increase of consumption was such that the prices of tin and lead went up considerably in the latter half of the year, and the Custom House returns show a more active trade with foreign countries and British possessions for all the superior metals. And it is worthy of consideration that of the quantities of these metals imported by us a large proportion was re shipped at a profit, preventing a glut in the home market. The result has been considerable activity in mining, especially for tin and lead. Cornwall, after a long depression, is looking up once more, and excellent opportunities for investment in prospective tin and lead mines are now open, of which we shall be happy to give correct information either at our office, or by post in answer to any correspondent who directs enquiries to us.

In a recent work by one M. Georges Lavalaye, a French political economist of eminence, it is maintained that the present commercial crisis is definitive: that opportunities for the profitable employment of money such as existed since 1858 will occur no longer, and that the strange incongruity will for some time appear of a plethora of money and paucity of trade. We think, however, that there are already indications of revived business demand, which would be sure to assert themselves if the warlike passions of a portion of continental Europe were to subside. On the Stock Exchange business was, probably, more dull and vapid than the oldest frequenter of it remembers, and several times in the course of the year there has been a *quasi panic*. Consols were quoted high at one time, 97¼, as there were no circumstances to induce holders to sell for investment in other directions. On the whole, it has been a year to be regarded with thankfulness that we tided through it without war or extensive bankruptcies, and that it throws no bleak shadow upon the year that now opens before us.

71, *Bishopsgate-street, Jan.* 1, 1878. JOHN B. REYNOLDS.

[For remainder of Original Correspondence, see to-day's Journal.]

# Meetings of Public Companies.

## THE RUSSIAN (VYKSOUNSKY) IRONWORKS COMPANY.

The annual meeting of shareholders was held on Dec. 29, at the Cannon-street Hotel,—Mr. WM. AUSTIN in the chair.

The report showed that the capital stock remained at 52,700*l.*, but the amount of debentures issued had increased to 8003*l.* 13*s.* 4*d.* Although the extreme depression in the iron trade continued, and had even been increased by the war, the directors had succeeded in continuing the operations of the company on a restricted scale, and the result had been a small profit to the company. In pursuance of the consent of the Imperial Government to advance on the iron manufactured by the company, which was sanctioned by the Emperor, the company had received 20,870*l.* Whilst the directors stated that they owed it to the liberality of the Imperial Government that they had been enabled to continue the works in operation. The Government had shown a fresh instance of their indulgence in allowing the postponement for one year, without interest, of the repayments of the instalment of 25,000 rs. on the rail mill advance falling due on Nov. 1 last.

The CHAIRMAN congratulated the meeting on the fact that the company was still in existence, considering that the bad state of business previous to the war had become still worse from the effects of the fearful war which was now raging, and also that such a company as theirs was exposed to great danger and vicissitudes. He thought that they had struggled on quite satisfactorily under the circumstances, and in a manner which many English ironworks would be glad to have equalled during the past year. The company had restricted its operations and reduced its stock. They had received favourable assistance from the Imperial Government during the year, and by that means had been enabled to continue their works in operation, and to show a slight profit for the year. They were thus kept in a position which would enable them to take advantage of any rebound that might take place in the state of business. Owing to the diminution in the value of the rouble the debt to the Government had been reduced from 10,000*l.* to 7500*l.*, and it was a pity they were not in a position to pay off the debt at the present reduced price of the rouble. The Government had evidently appreciated the regularity with which the company conducted its business, and were doubtless alive to the fact that the large population employed by the company should, under the present circumstances, be kept in regular employment. The company were negociating for the supply of a certain amount of war material, and only that day the board had received a telegram from their secretary at St. Petersburg to the effect that they had a very fair chance of obtaining a satisfactory order. During the Crimean War, when the present works were in other hands, a good deal of money was made in that way. Although the manufacture of those articles was not quite so easy now as then, on account of shells and other war-like implements having become more complicated, still they hoped to derive a satisfactory profit from that source. He trusted that there might soon be peace, and that the proverbial prosperity would follow the war.

After a short discussion, the CHAIRMAN stated that the meeting would be adjourned for a week, so that the resolutions might be legally passed, the present number at the meeting not being sufficient for the purpose.

A vote of thanks to the Chairman concluded the proceedings.

## RUSSIA COPPER COMPANY.

The ordinary general meeting of shareholders was held at the City Terminus Hotel, Cannon-street, on Dec. 29,

Mr. ALEXANDER BROGDEN, M.P., in the chair.

Mr. C. T. MOORE (the secretary) read the notice convening the meeting, and the reports and accounts were taken as read.

Mr. CHESTER, at the outset, expressed his opinion that it was unfitting for Mr. Brogden to preside over the meeting, and suggested that Mr. Davenport (a director) should take the chair.

Mr. J. T. DAVENPORT thought the interest of the company would be served by allowing Mr. Brogden to proceed with the business of the meeting. Since he had been a member of the board he had always found that Mr. Brogden had endeavoured to the utmost of his ability to make the company a paying concern. (Hear, hear.) Many gentlemen in the room appeared to be under a very false impression with regard to Mr. Brogden's connection with the company. Unfortunately, a fire had occurred at the works, but the effect of this would only be temporary. The buildings were nearly fully insured, and it was believed that the sale of one portion of their estates would entirely remove the liability to the debenture holders, and they would then have all the smelting-works and the mines at work. If this were done he believed the company would soon pay 5 per cent. to the ordinary shareholders.

Mr. J. E. BARTLETT having born testimony to the exertions of Mr. Brogden in the interests of the company, some further discussion ensued, and the SOLICITOR of the company having replied to various objections raised by Mr. Chester,

The CHAIRMAN said he was anxious that the meeting should be as harmonious as possible, and had, therefore, suggested to his colleagues that one of the other directors should preside over the meeting, but they unanimously requested him to take the chair. He was quite prepared to admit that there were good grounds for being dissatisfied with the position of the company, and nobody could be more sorry than he was himself that that was the case. The directors in circulating their report had endeavoured to state as succinctly and as clearly as they could the exact position of the company. In reference to all the departments of the business, except that of smelting at Voskresensky, he might fairly ask the shareholders to admit that there had been a material improvement in the past year as compared with the year which preceded it. Whether the unsatisfactory nature of the smelting was due wholly or only partially to bad management at the works he could not say at present. Those works which now showed a loss had hitherto, since the formation of the company, yielded a profit, and this affected the financial position to the extent of about 2000*l.* The remainder of the loss had been caused by bad work in the furnaces, and not by any depreciation in the richness of the material. The new manager of the smelting-works—Mr. Turner—was doing a good deal better than Mr. Koch had done, and it was hoped that good results would be shown in the future. Then there was an item of loss on exchange, owing to the depreciated value of the rouble. But the two things probably more important to dwell upon than anything else at the meeting were the disastrous fire which had occurred and the financial position of the company. The report had been circulated amongst the directors, and a board meeting had been convened to revise and correct it before the news of the fire arrived. They were all naturally very much shocked and disheartened when the telegram arrived announcing this disaster, but up to the present time the accounts of the fire were only of a limited character, stating that the roof of the smelting-house had been burnt, and that the machinery of the smelting works had been burnt or considerably damaged. Mr. Rickard estimated that the loss to the company by this fire would be about 1000*l.*, but at present, of course, no exact estimation of the actual loss the company would sustain could be made. The matter was a very serious one, more especially on account of the interruption which at the works the fire would necessitate. Three of the furnaces had been started again, and probably by this time a fourth furnace would be at work. In the first four months of the present year the works at Voskresensky had done better than in the corresponding four months of the previous year, the results being 77 tons as compared with 44 tons, and there was great reason to expect that they would at any rate make as much copper this year, notwithstanding the interruption, as they did last year. The principal loss would be that sustained by the destruction of the reduction works, which would probably amount to 5000*l.* Mr. Turner had so far very much improved upon Mr. Koch's management, and was now doing very good work, and the production of copper by wet process was now actually in progress. It was not the intention of the directors to commence the restoration of the works, but to recommend that Mr.

Mackay, who had been appointed receiver by the Court of Chancery, should go out to the property to inform himself personally of the actual state of things, and upon his report they would base their propositions as to the future of the company. Mr. Mackay was a member of the firm of Robert Fletcher and Company, who had had the management of the company for between three and four years, and had devoted a great amount of care and attention to the business of the company, in which they were themselves largely interested. The board represented nearly one-fifth of the whole share capital of the company, and the managers and their friends represented nearly the whole of the debenture capital. The shareholde s might, therefore, be quite assured that in Mr. Mackay they would have a representative interested in arriving at a successful result. With regard to the financial position of the company Mr. Fletcher had communicated with many of the debenture-holders, and they had expressed themselves in such a manner as to give every hope that if the shareholders acted judiciously they would fall in with the suggestion contained in the report—that they should capitalise their interest for two or three years until the company could be re-instituted or re-organised to carry out business in a proper manner. One portion of the property—the timber property at Preobrajensky—might be sold, so that the whole of the debentures and the Russian mortgage might be paid off, leaving the other two properties intact, and the whole of the smelting and reduction works. The Chairman then quoted a few items from the accounts, and made one or two estimates; he also said it appeared that they had a clear profit of 5000*l.* easily within reach, and that sum would be capable of considerable enlargement. After waiting comment and enquiry the Chairman concluded by moving the adoption of the report and balance-sheet.

Mr. J. E. BARTLETT seconded the motion, which was put and carried with one dissentient.

The CHAIRMAN, in reply to a question, said none of the directors had reduced their holdings since the previous meeting.

Mr. Bartlett, the retiring director, and Messrs. J. Ball and J. Glegg, the auditors, were re-elected.

The meeting was then constituted an extraordinary one, and the secretary having read the notice convening it,

Mr. R. FLETCHER referred to the connection of his firm with the company. They were large debenture-holders in the company, and all that they required was that the property should be protected. He thought this would be effected by the visit of his partner—Mr. Mackay—who had been appointed receiver upon the application of one of the debenture-holders. The Preobrajensky estate, which it was proposed to dispose of, consisted of about 240,000 acres of timbered land. Since the company was formed, the railway had been extended nearer to the estate by 800 miles, and before the war the Russian Government had decided that the eastern extension should be from Orenburg, and this would bring the railway at about 100 miles east of Orenburg to 20 or 30 miles only from the river, down which the timber is floated. This would, no doubt, largely increase the value of the property. Out of the 29,000 shares the directors had received the support of at least 17,000 in favour of a voluntary winding-up and reconstruction of the company.

The CHAIRMAN then proposed the company should be wound-up voluntarily.

Mr. BARTLETT seconded the motion, which was carried unanimously, as were also resolutions appointing Mr. Mackay liquidator, and appointing Messrs. A. Brogden, M.P., G. Anderson, M.P., J. E. Bartlett, J. T. Davenport, G. F Laity (directors), and Messrs. Jones and Sadler (shareholders), with power to add two debenture-holders, as a committee to act with the liquidator for the winding up of the company, and in the preparation of a scheme for its reconstruction.

The meeting then separated.

## MALPASO GOLD WASHING COMPANY.

The ordinary general meeting of shareholders was held at the offices of the company, Old Broad-street, on Friday, Dec. 28,

Mr. ALFRED COBBETT, the Chairman of the company, presiding.

Mr. SYDNEY A. COBBETT (the secretary) read the notice calling the meeting.

The accounts, made up to August 31 in Colombia, and in London to November 30, showed that during the past year the returns had been 499 73 ozs. of gold, realising 1860*l.* 14s. 6d., obtained at a cost of 3027*l.* 17s. 3d., showing a loss on the year's working of 1167*l.* 2s. 9d. These returns have been obtained from 3705 hours' washing, with an average head of water of 473 inches. In the report the directors stated that the results had been a great disappointment to them, as they were led to hope by the good returns made at the end of the last financial year that the company had then entered upon an era of prosperity. During the earlier part of the current year a revolution (now ended) was in progress in the United States of Colombia, which prevented powder being obtained, and so necessitated a removal of operations from the spot which yielded such large profits. On resumption of work at this spot a sand streak entirely cut out for a time the rich gravel, and reduced the monthly returns to a lower average than had ever before been touched. It would, however, be noticed that at the date of the last advices the good gravel was again appearing, the results for the run being more than double those obtained for many months previously. In conclusion, the directors stated that notwithstanding all the disappointments encountered in the working of the Malpaso Mine their opinion of its value was unaltered. They are convinced that when once the washing can be carried on continuously at a point deep enough to bottom the channel of auriferous gravel proved to exist the company cannot fail to make large returns, which, taking into consideration the area of ground available, will only be limited by the amount of water brought to bear upon it.

The CHAIRMAN said he had little to add to the information contained in the report and accounts, which set forth very clearly the present position of the company, as regarded the operations on the other side. The last time he had the pleasure of meeting the shareholders they were in possession of very considerable returns, which he then hoped would continue. But at the same time the revolution was then taking place, and although at the board they had information that it had terminated, such afterwards turned out not to be the case, and the revolution continuing took away the men, hindered the stores from reaching the spot, and altogether upset the operations of the company. Since then there had been very small returns for a considerable time, but now they were in receipt of considerably improved returns, and by the latest advices received from Mr. Welton, the superintendent, the directors were led to hope (and he trusted those hopes would be realised) that those returns would still further improve. Mr. Welton now proposed to bring back the works to the point at which Mr. Clarke, who was formerly the superintendent, started, and, having tested that portion of the mine as far as could be done by sinking shafts, Mr. Welton expected that the company would achieve very good results. The shareholders had the opportunity of seeing every portion of the accounts which came over here, and were, therefore, as *en courant* with what was going on as the directors themselves were. The only matter fresh was what had been received since the report was issued, and he would read an extract from a letter which was received only the previous day. Under date Nov. 19, Mr. Welton wrote: "Run No. 40, from Oct. 20 to Dec. 17. The clean-up after this run, during which washing was carried on for 410 hours, with a head of water of 500 in., produced from upper sluice amalgam 213·40 ozs., from wheeling gravel into the lower sluice 61·90 ozs.; total amalgam obtained, 275·50 ozs., valued at $1933 (386*l.*). The gravel wheeled into the sluice appears to have given as good results as last, considering the delays that have taken place in running. The gravel at the head of the sluice continues of the same quality as last, and our returns will improve when we are able to run full time. I shall write the board again on the 28th inst. upon the state of the mine.—New Opening: The opening we have commenced is situated at about 200 ft. to the east, and parallel with the present sluice, and is the one the late superintendent was preparing to carry into effect. So far very little progress has been made, on account of the very large quantity of waste, and the bottom being thickly covered with large boulders. To-day I have taken advantage of the opportunity (whilst the cuts are being got down to put in some 50 ft. of new sluice at the head) to turn in all our supply of fresh water to see if the greater portion of the waste can be run off along the line of the new opening, as if this cannot be done it will take more than a year to bring up this opening by any other means, and we may have to be content with less than 30 ft. grade gain for the present." So it would be seen they were going back parallel with the old workings, which in Mr. Clarke's time gave such good results, even with a much less quantity of water than they could command at present. In conclusion the Chairman moved the adoption of the report and accounts.

Mr. C. HOPKINSON seconded the resolution.

The CHAIRMAN, in answer to a question, said the present sluice would be carried on the level of the bed-rock.

Mr. PECHEY said at the time of the last meeting Mr. Welton proposed to go in at an entirely different point, but by sinking shafts and by different testings he had come to the conclusion that for the present it would be better to bring up a second deeper sluice parallel with the present one.

The resolution was then put and carried.

Mr. C. HOPKINSON moved the re-election of Mr. Alfred Cobbett as a director, and said they were very much indebted to that gentleman for the very valuable services he had rendered to the company.

Mr. P. J. G. ROUQUETTE seconded the resolution, which was put and carried.

On the motion of Mr. STEELE, seconded by Mr. STONE, Mr. Pechey was re-elected a director.

On the motion of Mr. STEELE, seconded by Mr. STONE, Mr. L. H. Evans was re-appointed auditor.

On the motion of Mr. STEELE, a vote of thanks was passed to the Chairman and directors, and the meeting broke up.

## MALABAR GOLD WASHING COMPANY.

The ordinary general meeting of shareholders was held at the offices of the company, Old Broad-street, on Friday, Dec. 28,

Mr. ALFRED COBBETT, the Chairman of the company, presiding.

The notice calling the meeting was read by Mr. SYDNEY A. COBBETT, the secretary.

The report of the directors, which was taken as read, stated that the past year's working at the mine, although carried out with but a small excess of expenditure over returns, had nevertheless done but little to solve the problem as to whether a definite channel of auriferous gravel existed at Malabar. The eastern banks, to test which additional capital was raised, were reached about the month of August, 1876. Since then the monthly produce and expenditure at the mines, exclusive of stores sent from this side, have been as follows:—Cost from Aug. 31, 1876, to Aug. 31, 1877, $13,214; returns, $13,120. During the above period the superintendent estimates that 700,000 cubic yards of gravel were washed, showing the extremely poor return of less than 2 cents, or 1d., per cubic yard, so that it will at once be seen that even should a small improvement take place in the value of the gravel a fair profit would result. At one time the directors believed that notwithstanding the extreme poorness of the gravel it would be possible, by strict economy, and, if necessary, by the supply of extra monitors, so as to avail themselves of the large supply of water at their command to realise a small profit upon the working of the mine, and thus carry on the work on the bank more as an exploration than otherwise. The superintendent, however, now advised the directors that, in his opinion, it would not be advisable for the present to go to the expense of sending out extra machinery, as, owing to the presence of boulders and pipeclay, the facilities for washing a large quantity of gravel, upon which would depend remunerative work, have diminished. By the latest advices the superintendent seemed a little more hopeful of equalising the costs and returns,

The CHAIRMAN: Gentlemen, I am very sorry that the report presented is not more satisfactory, but it is a true statement of the position of affairs at the time it was drawn up. Since then the board have received letters from Mr. O'Reilly of a more satisfactory character by the mail which arrived in the middle of the month, and the board thought that as the state of affairs out there had improved, the circumstance should be communicated to the shareholders. This was accordingly done by a circular sent with the report. Yesterday, by the usual monthly mail, were received advices of a still more satisfactory character, an extract from which I will read. Writing under date of November 19 Mr. O'Reilly says—"On the 12th instant we finished our change of distributor and monitor, and resumed work under much more favourable conditions than hitherto. Up to date of writing we have been enabled to run fully 20 hours out of 24, and, should no unforeseen circumstance occur, I think we shall be able to get in a full run within the month. The point we are now operating on is comparatively free from the obstructions so often alluded to, and I am now fully convinced that the gravel on this line is of far better quality than that to the right. A couple of runs in this direction will enable me to form a decisive opinion. I feel very great confidence that we shall far more than meet all expenses, and, such being the case, I will use every effort to push the work day and night. As usual, our work has proceeded with the greatest regularity. Our change of rig was effected in a very thorough manner, and worked well from the moment we turned the water on. We have had no breakages of any sort to notice, and only some slight interruptions from heavy rains. It is satisfactory to me to assure the board that I think there is now no immediate cause for entertaining the contingency of our being able to cover expenses. I shall clean up the sluice on the 16th or 17th prox., and I hope to get in 500 hours at least." Well, gentlemen, that is the position of our affairs, and I think you will admit that it looks very much more satisfactory than we have had for some time. (Hear, hear.) I do not know that I need say anything more, as, perhaps, I might weaken the force of what I have read to you. I will now move that the report and accounts, as circulated through the post, be and are hereby adopted.

Mr. DUNLOP seconded the resolution, which was put and carried without any discussion.

The CHAIRMAN: The next business is the election of directors. The directors who go out of office are Mr. Andrew Gray, Mr. J. T. P. Pechey. I move that Mr. Andrew Gray be and is hereby re-elected a director of the company.——Mr. DUNLOP seconded the resolution, which was put and carried.

The CHAIRMAN then moved the re-election of Mr. J. T. P. Pechey, which was seconded by Mr. COCHRAM, and carried.

On the motion of Mr. DUNLOP, seconded by Mr. COCHRAM, the auditor—Mr. L. H. Evans—was re-appointed, with a remuneration of five guineas.

Mr. DUNLOP moved a vote of thanks to the Chairman and directors, and said he was gratified to find that the hopes of the enterprise were not of so desperate a character as the original report led some of the shareholders to fear. It was gratifying to see that the two last advices which had been received went the one to confirm the other, and to verify in some degree the expectations which had been entertained with respect to the merits of the property. Those who studied the question of hydraulic gold washing knew that a very small percentage of gold would produce profitable returns, and as they could at Malabar almost pay expenses with 2 cents per cubic yard, it would be seen that with a very small improvement indeed in the percentage of gold a considerable profit would accrue to the company. Surveying the whole matter, he certainly was not inclined to look upon the future as without hope.

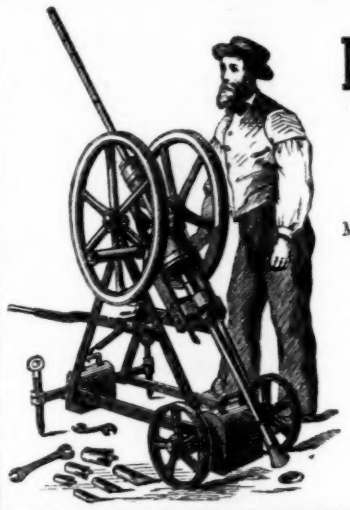
A SHAREHOLDER seconded the resolution, which was put and carried.

The CHAIRMAN acknowledged the compliment, and the meeting broke up.

[For remainder of Meetings, see to-day's Journal.]

CORNISH PUMPING ENGINES.—The number of pumping-engines reported for November is 16. They have consumed 1502 tons of coal, and lifted 10·9 million tons of water 10 fms. high. The average duty of the whole is, therefore, 49,000,000 lbs. lifted 1 ft. high, by the consumption of 112 lbs. of coal. The following engines have exceeded the average duty:—

| | |
|---|---|
| Dolcoath—85 in. ..... Millions | 54·6 |
| Mellanear—76 in. ..... | 58·9 |
| Mellanear—Gundry's 80 in. ..... | 50·0 |
| West Basset—Grenville's 70 in. ..... | 49·8 |
| West Basset—Thomas's 80 in. ..... | 53·2 |
| West Wheal Frances—58 in. ..... | 54·3 |
| West Wheal Seton—Harvey's 85 in. ..... | 59·2 |
| West Wheal Seton—Rule's 70 in. ..... | 62·5 |

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MOUNTED ON SUITABLE STANDS FOR SINKING, DRIVING, AND OPEN QUARRY WORK.

"TIMES," November 29th, 1877.

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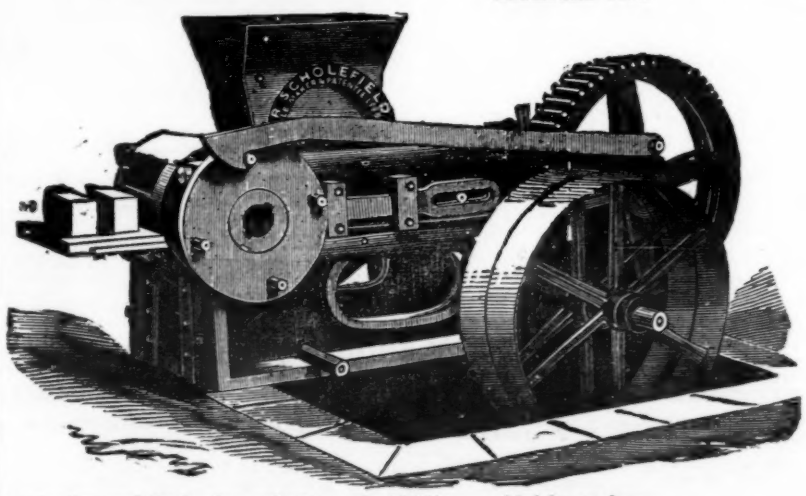
LATEST PATENT BRICK-MAKING MACHINE.
PATENTED 1873.

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| | |
|---|---|
| 2 men digging, each 4s. per day | £0 8 0 |
| 1 man grinding, 4s. 6d. per day | 0 4 6 |
| 1 boy taking off bricks from machine, and placing them in barrow ready for the kiln, 3s. per day | 0 2 0 |
| 1 boy greasing, 1s. 6d. per day | 0 1 6 |
| 1 engine-man, 5s. per day | 0 5 0 |
| 1 man wheeling bricks from machine to kiln, 4s. per day | 0 4 0 |
| Total cost of making 10,000 pressed bricks | £1 5 0, or 3s. 6d. per 1000. |

(SETTING AND BURNING SAME PRICE AS HAND-MADE BRICKS.)

N.B.—Where the material can be used as it comes from the pit, the cost will be reduced in digging.
As the above Machinery is particularly adapted for the using up of shale, bind, &c., it will be to the advantage of all Colliery Owners to adopt the use of the said Brick-making Machinery.

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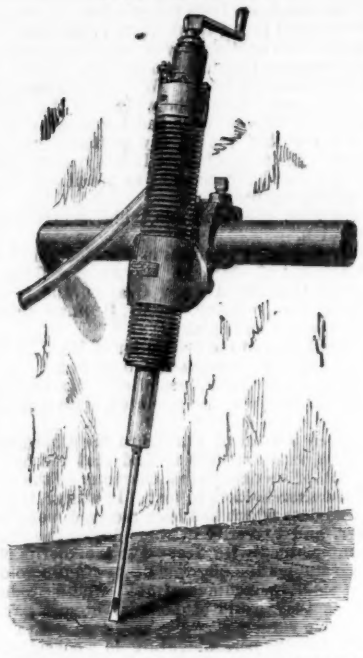

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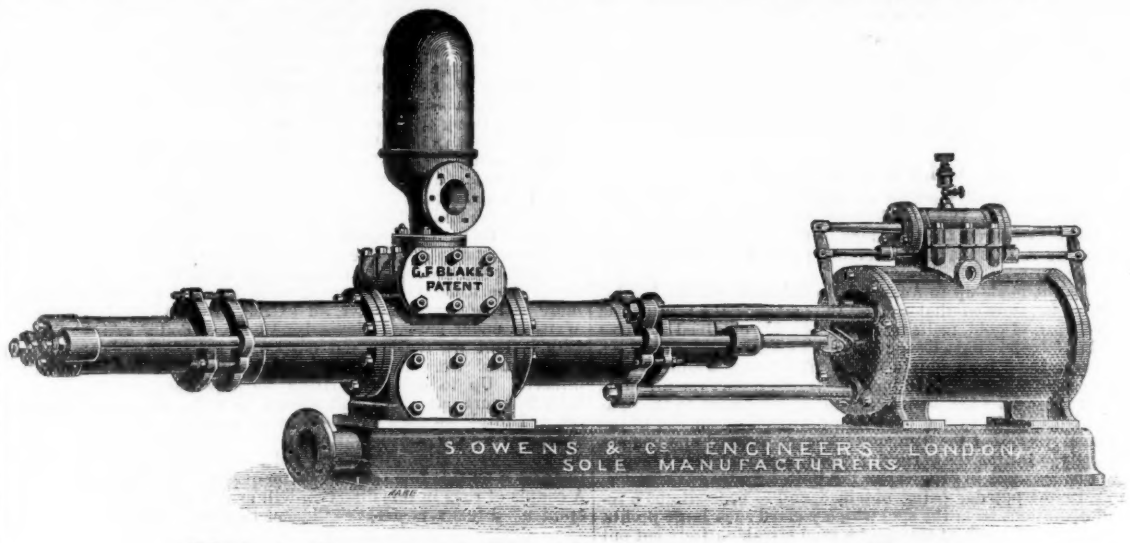
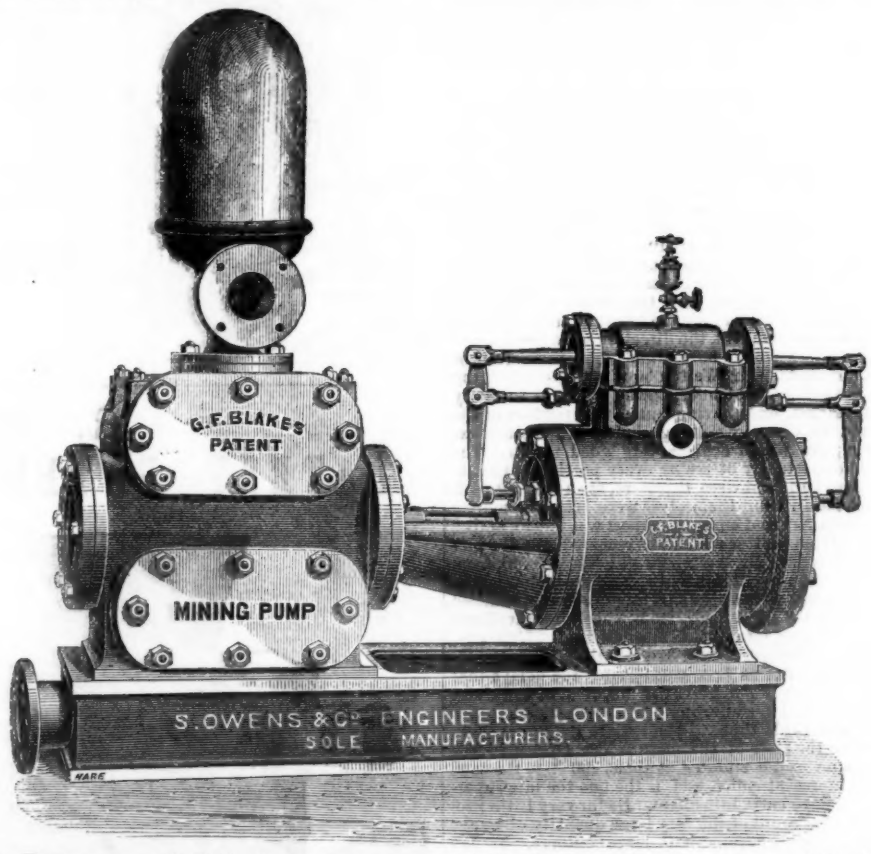



## Blake's Improved Double-plunger Steam Pump.

## S. OWENS AND CO.,

In placing the BLAKE STEAM PUMP before the mining world, believe they are offering the BEST, MOST RELIABLE, and ECONOMICAL PUMP that has yet been made, and solicit an inspection of various sizes in operation at their works, Whitefriars-street, Fleet-street, London.




## Blake's Improved Mining Pump, with Patent Removeable Lining to Pump Cylinder,

Any combination of these Pumps may be had to suit circumstances. The following are some of the SIZES SUITABLE FOR MINING PURPOSES:—

| | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dia. of steam cylinders.. In. | 12 | 12 | 12 | 12 | 14 | 14 | 14 | 16 | 16 | 16 | 16 | 18 | 18 | 18 | 18 | 20 | 20 | 20 | 20 | 24 | 24 |
| Dia. of water cylinders.. In. | 3 | 4 | 5 | 6 | 4 | 5 | 6 | 4 | 5 | 6 | 8 | 4 | 5 | 6 | 8 | 5 | 7 | 8 | 9 | 6 | 8 |
| Length of stroke ... ... In. | 18 | 18 | 18 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 30 | 30 | 30 | 30 | 30 | 36 | 36 | 36 | 42 |
| No. of strokes per minute.. | 30 | 30 | 30 | 30 | 25 | 25 | 25 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 20 | 20 | 17 | 17 | 17 | 15 |
| Quantity in gallons per hour, approxmately ... | 1440 | 2610 | 4200 | 5940 | 2940 | 4620 | 6600 | 2646 | 4158 | 5940 | 10620 | 2646 | 5160 | 7500 | 13260 | 4586 | 9000 | 12360 | 15660 | 6720 | 12000 |

PRICES FOR THE ABOVE, OR ANY SPECIAL SIZE, AND ILLUSTRATED CATALOGUES FURNISHED ON APPLICATION

## PATENT CONDENSERS

Can be supplied for any size pump to effect a saving of fully 30 per cent. in the consumption of fuel, greatly increasing their efficiency

## The Blake Pump will work under water, and as efficiently with compressed air as with steam.

BLAKE'S DONKEY PUMPS FOR FEEDING BOILERS KEPT IN STOCK.

AWARDED THE PRIZE MEDALS AT LEEDS, MANCHESTER, AND WREXHAM EXHIBITIONS, 1875 AND 1876.

# HADFIELD'S STEEL FOUNDRY COMPANY,

## ATTERCLIFFE, SHEFFIELD,

DEVOTE THEIR EXCLUSIVE ATTENTION TO THE MANUFACTURE OF

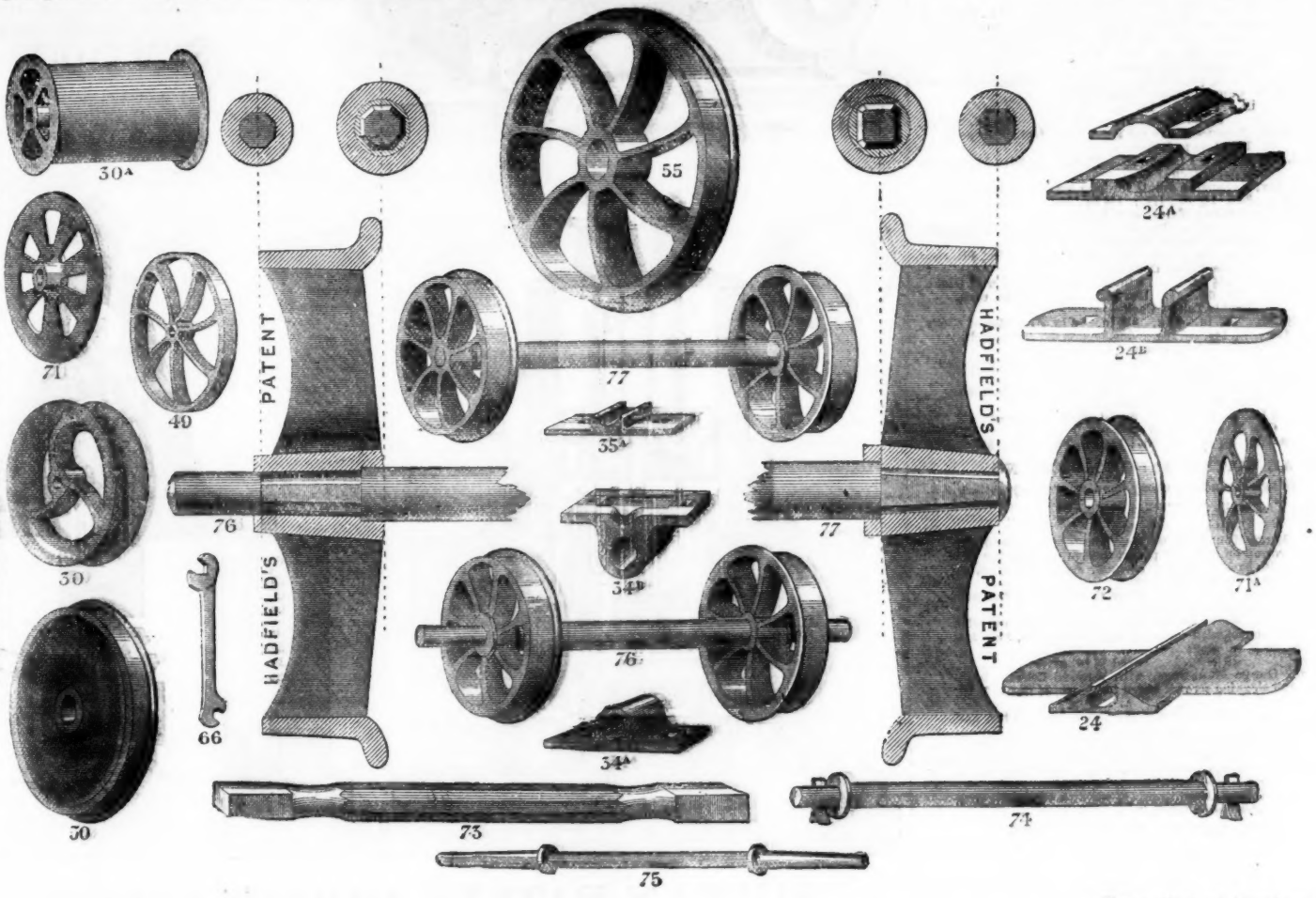
## CRUCIBLE STEEL CASTINGS, for Engineering and Machine Purposes,

AND ARE THE SOLE MAKERS OF

## HADFIELD'S CRUCIBLE STEEL WHEELS.

One of our departments is specially adapted for the manufacture of these Wheels (as shown below), for Collieries, Ironstone Mines, Slate Quarries, Ironworks, Lead Mines, &c., &c. We have made, and are now making, many HUNDRED THOUSANDS; and having Patented a New Method of Fitting Wheels upon axles, being cheap, effective, and expeditious, we can execute orders entrusted to us with promptitude, our capacity in this department alone being equal to about 2000 wheels per week.

N.B.—Prices per Set of Wheels and Axles, fitted complete, forwarded on receipt of diameter of wheel on tread, depth of tread, rail gauge, and thickness of axles and rolling load.




[This Sheet of Drawings is Copyright.

### HADFIELD'S PATENT METHOD OF FITTING WHEELS UPON AXLES.

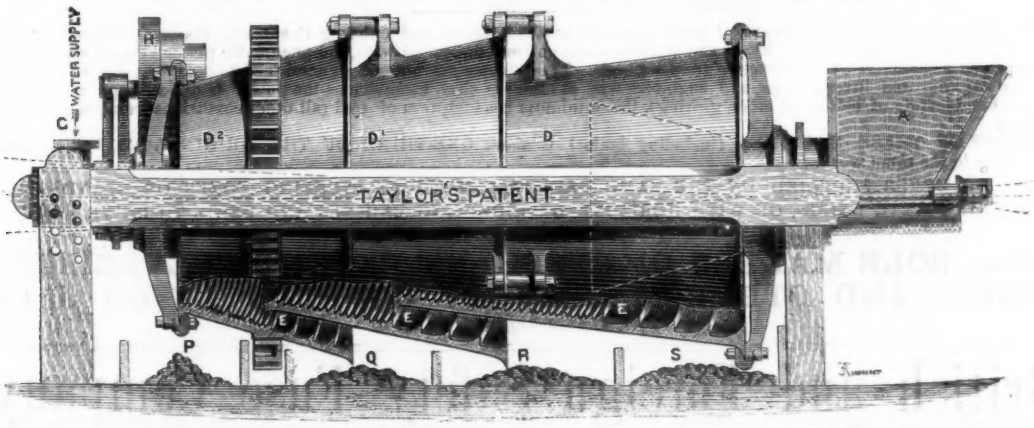
The advantages of the above system are that the Wheels being forced upon a Taper Square-ended Axle, by Machinery, and then riveted (the machine securing truth), it is impossible that they can come loose or get within gauge. They are very heaply fitted on, and run exceedingly true.

We construct the Arms of wheels upon the curved principle (as shown in the drawings above), consequently the shrinkage or cooling of the Castings is not interfered with, thus securing the greatest advantages of our very strong material.

CRUCIBLE CAST-STEEL WHEELS, when cast by us, are made from one-third to one-half lighter than Cast-Iron. They cannot be broken while working, even with rough usage, and will wear at least twelve times as long as Cast-Iron, thus saving animal and steam power, and reducing wear and tear immensely.

We would also draw special attention to our INCLINE PULLEYS and CAGE GUIDES, the adoption of which will prove highly advantageous.

FIRST SILVER MEDAL AWARDED BY THE ROYAL CORNWALL POLYTECHNIC SOCIETY, 1876.




# TAYLOR'S PATENT DRUM DRESSER,

FOR SEPARATING AND SIZING MINERAL AND OTHER SUBSTANCES.

By the aid of this invention any materials, which are of different specific gravity, can be concentrated and sorted mechanically, while in the case of ores the fine mineral is brought up with the larger particles instead of being washed into the waste—a most important feature.

This machine uses very little water in proportion to the quantity of material treated, and will be found a most useful and efficient dressing apparatus.

For further particulars, and to see machines at work, apply to the Patentee,

**H. E. TAYLOR, 15. Newgate Street, Chester.**

# MANCHESTER WIRE WORK.

NEAR VICTORIA STATION, MANCHESTER

(ESTABLISHED 1790).

## JOHN STANIAR AND CO.,

Manufacturers by STEAM POWER of all kinds of Wire Web, EXTRA TREBLE STRONG for

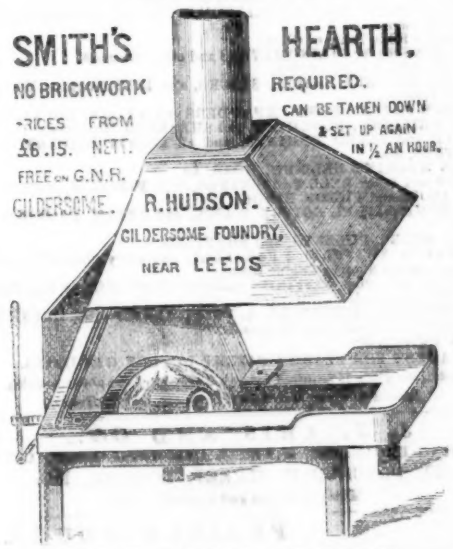
LEAD AND COPPER MINES.

Jigger Bottoms and Cylinder Covers woven ANY WIDTH, in Iron, Steel, Brass, or Copper

EXTRA STRONG PERFORATED ZINC AND COPPER RIDDLES AND SIEVES.

*Shipping Orders Executed with the Greatest Dispatch.*

IMPROVED IRON




GREAT SAVING IN ROOM.

**BENNETTS' SAFETY FUSE WORKS,**
ROSKEAR, CAMBORNE, CORNWALL.

BLASTING FUSE FOR MINING AND ENGINEERING PURPOSES,

Suitable for wet or dry ground, and effective in Tropical or Polar Climates.

W. BENNETTS, having had many years experience as chief engineer with Messrs. Bickford, Smith, and Co., is now enabled to offer Fuse of every variety of his own manufacture, of best quality, and at moderate prices.

Price Lists and Sample Cards may be had on application at the above address

LONDON OFFICE.—H. HUGHES, Esq., 48, GRACECHURCH STREET.

TO COLLIERY AND MINE OWNERS, ENGINEERS, IRONFOUNDERS AND CONTRACTORS, &c.

**JAMES AND KNOTT,**
DARLINGTON,

Are now in a position to SUPPLY their "SPECIAL" LUBRICATING OIL, PAINTS, PAINT OILS and VARNISHES of all kinds, TALLOW, SPUN YARNS, GREASE, COTTON WASTE, LEATHER BELTING, INDIA-RUBBER GOODS and STEAM PACKING, NAILS, BOLTS, RIVETS, VICES, &c., from stock, in large or small quantities, on receipt of orders.

Quotations given for new and secondhand machinery or stores, &c., on application to—

JAMES AND KNOTT, COLLIERY AND ENGINEERS' STORE
DARLINGTON

## S. T. SHUTTLEWORTH,

PATENTEE OF THE IMPROVED APPARATUS FOR PREVENTING INCRUSTATION IN BOILERS, &c.
MANUFACTURER OF SUPERIOR
GUN METAL STEAM COCKS, VALVES, BOILER MOUNTINGS,
nd CAST IRON STEAM and SAFETY VALVES, with GUN METAL SEATS
ALL ORDERS PROMPTLY EXECUTED.

LONDON OFFICE,—51, BISHOPSGATE STREET WITHIN, E.C.

**VALVES AND STEAM COCKS.**

Cast-iron Steam Valve, with Gun Metal Seats, new and improved pattern. (with flanges.)

(Screw Gland.) Gun Metal *Screw* Gland Steam Cock (black), shell pattern, female ends.

(Pin Gland.) Gun Metal *Pin* Gland Steam Cock (black), shell pattern, female ends—

| Prices— | ¼ in. | ⅜ in. | ½ in. | ¾ in. | 1 in. | 1¼ in. | 1½ in. | 2 in. |
|---|---|---|---|---|---|---|---|---|
| | 2s. 8d. | 3s. 4d. | 4s. | 6s. | 9s. 6d. | 13s. 6d. | 21s. 6d. | 32s. each. |

(Screw Bottom.) Gun Metal Screw Bottom Steam Cock (black), shell pattern, female ends, or male and female ends—

| Prices— | ¼ in. | ⅜ in. | ½ in. | ¾ in. | 1 in. | 1¼ in. | 1½ in. | 2 in. |
|---|---|---|---|---|---|---|---|---|
| | 2s. 3d. | 2s. 9d. | 3s. 3d. | 4s. 6d. | 8s. 6d. | 12s. | 17s. 6d. | 26s. each. |

(London Pattern.) Gun Metal Steam Cock, London shell pattern, polished bright, male and female ends; the heaviest in the trade—
¼ in., 4s. 6d.; ⅜ in., 7s.; 1 in., 10s.; 1¼ in., 15s.; 1½ in., 22s.; 2 in., 36s. each.

Gun Metal Steam Valves, brass or iron wheels; improved, screwed female ends—

| ¼ in. | ⅜ in. | 1 in. | 1¼ in. | 1½ in. | 2 in. | 2½ in. | 3 in. | 3½ in. | 4 in. |
|---|---|---|---|---|---|---|---|---|---|
| 4s. 6d. | 6s. 6d. | 8s. 6d. | 11s. 6d. | 14s. | 22s. 6d. | 35s. | 48s. | 60s. | 80s. 120s. each. |

The same with Flanges—
¼ in., 7s.; ⅜ in., 8s.; 1 in., 12s.; 1¼ in., 17s. 6d.; 1½ in., 20s.; 2 in., 32s. 6d. each

Gun Metal Ground Steam Union Joints—

| ¼ in. | ⅜ in. | ½ in. | ¾ in. | 1 in. | 1¼ in. | 1½ in. | 2 in. |
|---|---|---|---|---|---|---|---|
| 2s. 6d. | 2s. 9d. | 3s. | 4s | 5s. 6d. | 7s. 6d. | 10s. 6d. | 16s. 6d. each. |

Gun Metal Clack or Back Pressure Valve for Feed Pipes from Pumps or Injectors to Boilers—
⅜ in., 4s.; ½ in., 4s. 6d.; ¾ in., 6s.; 1 in., 8s. 6d.; 1¼ in., 11s. 6d.; 1½ in., 14s. each.

Gun Metal Stuffing Box, Expansion Joints for long lengths of Piping—
½ in., 4s.; ¾ in. 6s.; 1 in., 8s.; 1¼ in., 11s.; 1½ in., 14s in., 21s. each.

Gun Metal Safety Valve, with Lever—
½ in., 6s.; ¾ in., 8s.; 1 in., 10s.; 1¼ in., 12s. 6d.; 1½ in., 15s.; 2 in., 20s. each.

Gun Metal Steam Whistle—
1¼ in., 9s. 6d.; 2 in., 12s.; 2½ in., 16s.; 3 in., 25s.; 3½ in., 33s.; 4 in., 40s. each.

Single Tallow Cock—

| 1½ in. | 2 in. | 2½ in. | 3 in. | 4 in. diameter of Globe. |
|---|---|---|---|---|
| 4s. 6d. | 6s. 6d. | 8s. 6d. | 12s. 6d. | 17s. 6d. each. |

Double Tallow Cock—

| 1½ in. | 2 in. | 2½ in. | 2¾ in. | 3 in. | 3½ in. | 4 in. diameter of Globe. |
|---|---|---|---|---|---|---|
| 7s. | 9s. 6d. | 12s. | 14s. | 16s. | 18s. | 24s. each. |

Gun Metal Throttle Valves, screwed for iron pipe—
¾ in., 6s. 6d.; 1 in., 9s. 6d.; 1¼ in., 14s.; 1½ in., 19s. 6d.; 2 in., 33s. each.

Gun Metal Pet Cocks, with cleaning screw—
⅜ in., 3s. 11d.; ½ in., 4s. 5d.; ⅝ in., 6s.; ¾ in., 7s.; 1 in., 10s. each.

Gun Metal Pet Cock—
⅜ in,, 3s. 8d.; ½ in., 4s. 6d., ¾ in., 6s. 9d. each. Screwed.

Gun Metal Blow-off Cocks—
½ in., 7s. 6d.; 1 in., 10s. 6d.; 1¼ in., 14s. 6d.; 1½ in., 19s.; 2 in., 33s. each.

**GUN METAL WATER GAUGE MOUNTINGS.**

Set of Gun Metal Gauge Mountings, ebony handles, ordinary pattern.
½ in glass ... ... ... ... ... ... ... ... ... ... ... Per set 16s.
Ditto ditto ditto ⅝ in. glass ... ... ... ... ... 23s
Ditto ditto ditto ¾ in. ,, ... ... ... ... ... 30s

Set of Gun Metal Water Gauge Mountings, with solid bottom cocks and gun metal packing rings ground on to top of plugs, thus preventing the possibility of leakage, with back nuts and cleaning screws; gun metal handles, bored for either ½ in. or ⅝ in. glass... .. ... ... ... ... ... 31s.

Set of Gun Metal Water Gauge Mountings, similar to the above, but with gun metal flanges, bored for ½ in. or ⅝ in. glass ... ... ... ... ... ... 34s.

Set of magnificent Gun Metal Water Gauge Mountings, very heavy, with solid bottom cocks, as above, with cleaning caps, back nuts, &c., &c., bored for either ⅝ in. or ¾ in. glass ... ... ... ... ... ... ... ... ... 44s.
Ditto ditto ditto bored ⅞ in. glass ... ... ... 56s.

Set of Gun Metal Water Gauge Mountings, with screwed bottom, brass handles, back nuts, and cleaning screws, bored for ½ in., ⅝ in., or ¾ in. glass ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... 27s.

Set of Gun Metal Gauge Mountings, similar to the above, but lighter, and bored for ½ in. or ⅝ in. glass ... ... ... ... ... ... ... ... ... ... 23s.

Set of Gun Metal Water Gauge Mountings, similar to the above, but lighter, and bored for ⅜ in. glass. These are suitable for Agricultural Engines 18s. 9d.

Set of Gun Metal Gauge Mountings, with hollow plugs, upon Needham's principle (suitable for locomotives), bored for ⅝ in. or ¾ in. glass... ... 36s.

Set of "Valve" Gun Metal Gauge Mountings (¼ turn to blow off), with back nuts and ebony handles, bored for ½ in. or ⅝ in. glass ... ... ... 28s

**BEST GREEN GAUGE GLASS TUBES.**

| Inches long. | ½ in. s. d. | ⅝ in. s. d. | ¾ in. s. d. | ⅞ in. s. d. | 1 in. outside diam. s. d. | |
|---|---|---|---|---|---|---|
| 12 | 3 9 | 4 6 | 5 4 | 6 8 | 8 0 | per doz. |
| 13 | 4 0 | 5 0 | 6 0 | 7 4 | 8 8 | ,, |
| 14 | 4 3 | 5 6 | 6 8 | 8 0 | 9 4 | ,, |
| 15 | 4 6 | 6 0 | 7 4 | 8 8 | 10 0 | ,, |
| 16 | 4 9 | 6 6 | 8 0 | 9 4 | 10 8 | ,, |
| 17 | 5 0 | 7 0 | 8 8 | 10 0 | 11 4 | ,, |
| 18 | 5 3 | 7 6 | 9 4 | 10 8 | 12 0 | ,, |
| 19 | 5 6 | 8 0 | 10 0 | 11 4 | 12 8 | ,, |
| 20 | 5 9 | 8 6 | 10 8 | 12 0 | 13 4 | ,, |
| 21 | 6 0 | 9 0 | 11 4 | 12 8 | 14 0 | ,, |
| 22 | 6 3 | 9 6 | 12 0 | 13 4 | 14 8 | ,, |
| 23 | 6 6 | 10 0 | 12 8 | 14 0 | 15 4 | ,, |
| 24 | 6 9 | 10 6 | 13 4 | 14 8 | 16 0 | ,, |

Steam Packing, Asbestos, Soapstone, Core, Blacklead, and all other kinds kept in Stock.

THAM PRESSURE and VACUUM GAUGES, Bourdon's and other Makers.
ANTIFRICTION METAL—Babbitt's, Fenton's, and Kingston's.
LUBRICATORS—Ramsbottom's, Roscoe's, and NEEDLE, &c.
Sole Maker of HOW'S PATENT SALINOMETERS and HYDROMETERS for Marine Boilers.
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DUDGEON'S PATENT TUBE EXPANDERS and HYDRAULIC JACKS.
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PORTABLE and FIXED ENGINES, and all kinds of BOILERS, WATER HEATERS, &c.
LEATHER MACHINE BELTING, HOSE, &c.
GREENE'S and other BELL FASTENINGS, OIL FEEDERS, NEEDLE LUBRICATORS and PISTON RINGS.
BOILER COMPOSITION, COTTON WASTE, and STEAM PACKING, of all kinds.
WHEELS, AXLES, PULLEYS, and SHAFTING.
VICES, BENCH, SWIVEL and PARALLEL, and every kind of Engineering requirement for Shop or Engine Room.
GUN METAL and other CASTINGS made to DRAWINGS to any SPECIFICATION submitted.
SHARP STEWART'S INJECTORS, A. FRIEDMANN'S ditto, GRESHAM and CRAVEN'S ditto, and other Makers.
DONKEY PUMPS, &c.

AGENT FOR EZARD'S PATENT DUPLEX GAS IRONS.

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MINING ENGINEERS, MINERAL AND METAL MERCHANTS,
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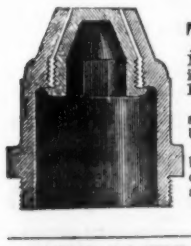
Mines inspected and reported upon.

**FUSIBLE PLUGS.**



THE NATIONAL BOILER INSURANCE COMPANY (LIMITED), 22, ST. ANN'S SQUARE, MANCHESTER, have acquired the PATENT of most important IMPROVEMENTS in DOUBLE CONE FUSIBLE PLUGS.

When fusion occurs a new cone is immediately inserted without removing the manhole cover, and the boiler at once re-started.

The fusible metal is quite protected from deterioration by fire, entire detachment of the inner cone and a large clear opening is secured in case of deficiency of water, and serious injury or explosion of the boiler prevented.

No other Plugs possess such valuable advantages.

For full particulars, apply as above.

**MAPS OF THE MINES, AND OF UTAH TERRITORY.**

FROISETH'S NEW AND REVISED MAP FOR 1875.—Size 40 by 56 inches, scale 8 miles to the inch. Handsomely engraved, coloured in counties, showing the Towns, Settlements, Rivers, Lakes, Railroads, Mining Districts, &c., throughout the Territory, and all the Government Surveys to date. Mounted on cloth, £2; half-mounted, £1 12s.; pocket form, £1.

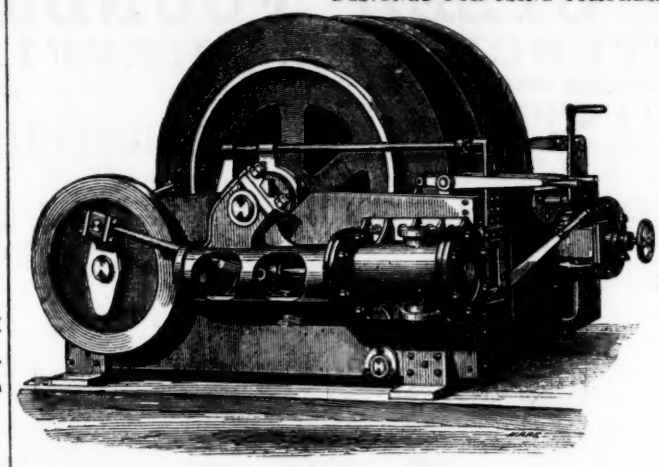
Also, GENERAL MINING MAP OF UTAH, showing twenty-eight of the principal Mining Districts adjacent to Salt Lake City, and location of the most prominent mines. Price, pocket form, 6s.

Also, NEW MAP OF LITTLE AND BIG COTTONWOOD MINING DISTRICTS, showing the location of over Four Hundred Mines and Tunnel Sites, together with the Mines Surveyed for United States Patent. Price, sheets, 6s.; pocket form, 8s.

For sale, and supplied by—
TRUBNER and Co., 57 and 59, Ludgate Hill, London; or
B. A. M. FROISETH, Salt Lake City, Utah, U.S.

## STEVENS' PATENT UNDERGROUND WINDING ENGINE,

DESIGNED FOR USING COMPRESSED AIR OR STEAM,



**SIMPLE, COMPACT, PORTABLE.**

*Silver Medal, Royal Cornwall Polytechnic Society*, 1876.

No. 1 size, 7 in. single cylinder, with 2 ft. drums.
No. 2 size, 9 in. single cylinder, with 2 ft. 6 in. drums.
Larger sizes made with two cylinders.
A,— 6 in. double cylinder, with 2 ft. 3 in. drums.
B,— 8 in. ,, ,, 3 ft. 0 in. drums.
C,—10 in. ,, ,, 3 ft. 6 in. drums.
D,—12 in. ,, ,, 4 ft. 6 in. drums.

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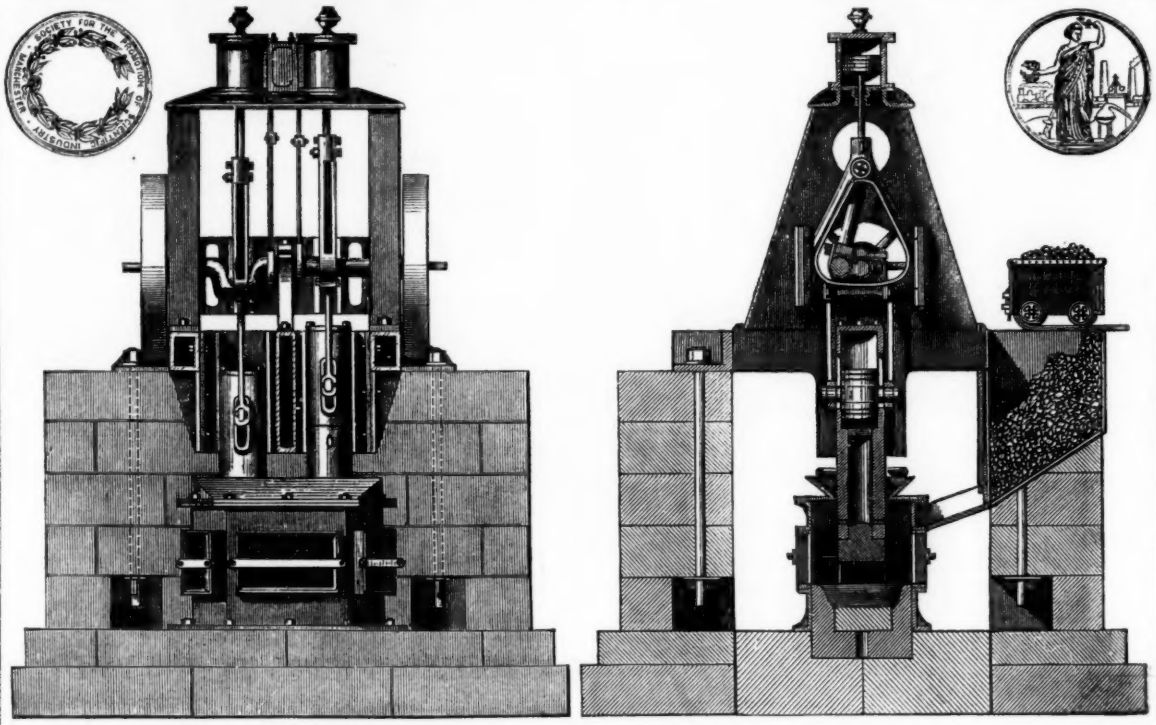
**THE USKSIDE CO.,**

ENGINEERS, MAKERS OF PUMPING AND WINDING MACHINERY, AND FORGINGS OF EVERY DESCRIPTION,

NEWPORT, MON

Agents for the six Northern Counties—
TANGYE BROTHERS, ST. NICHOLAS BUILDINGS, NEWCASTLE-ON-TYNE.

[This Advertisement appears fortnightly.]



## SHOLL'S PATENT DIRECT-ACTING PNEUMATIC STAMPERS,

**For Pulverising Tin and Lead Ores, Gold Quartz, &c.,**

SOLE MAKERS FOR CORNWALL,

**N. HOLMAN AND SONS,**

ST. JUST FOUNDRY, NEAR PENZANCE, CORNWALL.

All objectionable features of "wear and tear" common to the original and existing Pneumatic Stamps (driven by belts) are removed in this patent, and leather bands and stuffing boxes entirely dispensed with, the pneumatic piston being reciprocated into the compressing chambers by direct-action from without. These double machines are guaranteed to be of the capacity of 36 ordinary heads of cam and lifter stamps, and engineers will at once see that, inasmuch as the power is directly applied to its work (without the medium of belts and other gearing), the minimum consumption of coal (all other conditions being equal) must be the result.

The COST OF THESE MACHINES (including boiler) is about ONE-THIRD OF THE ORIGINAL CAM AND LIFTER STAMPS, to do the same work.

ROTARY STAMPERS SUPPLIED ON THE SAME PRINCIPLE, WITHOUT STUFFING BOXES OR GLANDS, WHERE RUNNING GEAR EXISTS, OR WITH HORIZONTAL CONDENSING ENGINES AND BELTS TO DRIVE THEM, IF PREFERRED.

**Also, SOLE MAKERS OF STEPHENS' PATENT PULVERISER.**
**MINING AND OTHER MACHINERY CONSTANTLY ON SALE,**
NEW AND SECOND-HAND.

## British and Foreign Safety Fuse Company,

REDRUTH, CORNWALL,

MANUFACTURERS OF

**SAFETY FUSE,**

FOR MINING AND QUARRYING PURPOSES.

PRICES ON APPLICATION.

## THOMAS TURTON AND SONS,

MANUFACTURERS OF

**MINING STEEL of every description.**

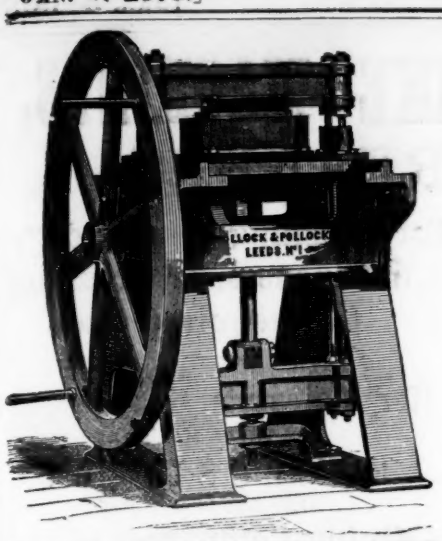
CAST STEEL FOR TOOLS. CHISEL, SHEAR, BLISTER, & SPRING STEEL

**MINING TOOLS & FILES of superior quality.**

EDGE TOOLS, HAMMERS, PICKS, and all kinds of TOOLS for RAILWAYS, ENGINEERS, CONTRACTORS, and PLATELAYERS' LOCOMOTIVE ENGINE, RAILWAY CARRIAGE and WAGON SPRINGS and BUFFERS.

**SHEAF WORKS AND SPRING WORKS, SHEFFIELD.**

LONDON OFFICES.—35, QUEEN STREET, CITY. PARIS DEPOT—12, RUE DES ARCHIVES.
NEW YORK STORE—102, JOHN STREET.




# POLLOCK AND POLLOCK,

## LONGCLOSE WORKS, NEW TOWN, LEEDS,

## POLLOCK'S PATENT BRICK PRESS,

## The New "XL" Brick-Making Machines,

THE CHEAPEST AND BEST IN THE MARKET.

**Improved Grinding Pans, with patent self-acting delivery.**
**Vertical and Horizontal Engines.**

COLLIERY ENGINEERS.—WINDING ENGINES OF ALL SIZES.

POLLOCK AND MITCHELL'S PATENT KILNS are the Cheapest and Simplest.

**London Office —155, Fenchurch Street, E.C.**

---

# JOSEPH FENTON & SONS,

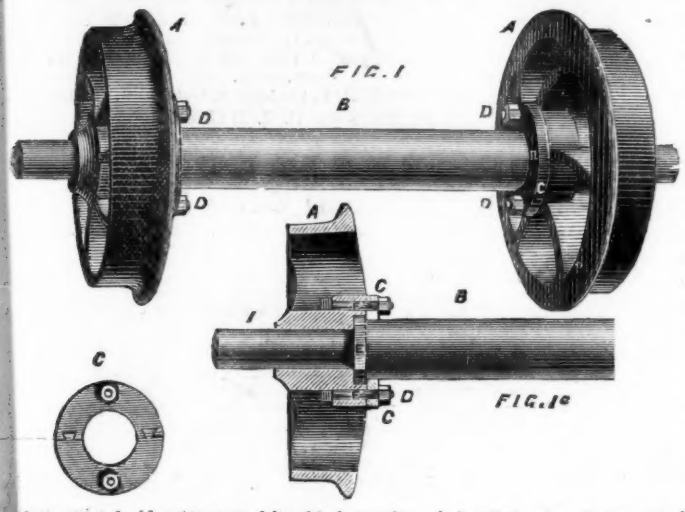
## SYKES WORKS, SHEFFIELD, and 118, Cannon-street, LONDON, E.C.,

MANUFACTURERS OF

## CRUCIBLE CAST STEEL CASTINGS,

HAVE PLEASURE IN CALLING THE ATTENTION OF THE MINING WORLD TO THEIR

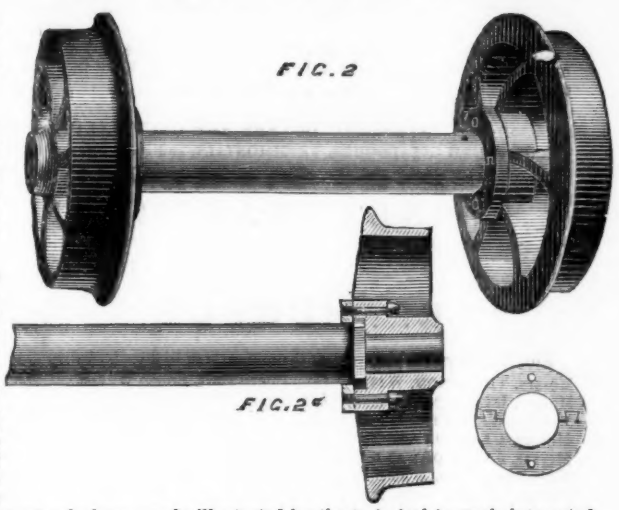
## Patent Method of Fitting up Cast Steel Wheels and Axles.




Figs. 1 and 1a show a longitudinal view and plan of a pair of corf wheels and axles fitted up for outside bearings. A A, are the wheels; B, is the axle; C C, the washers; D D, the bolts; E, the collar on axle B; and F, the recessed boss in the wheel.

The wheel is cast with a recessed boss in the inside, made to any shape, corresponding in shape and depth with a collar formed on the axle. Figs. 2 and 2a show a longitudinal view and plan of a pair of corf wheels fitted up for inside bearings. The washers are secured to the boss of the wheel in outside bearings by bolts and nuts, and in inside bearings by set screws.

The advantages of the above system are:—A, the singular simplicity of fitting—enabling any inexperienced person, with the aid of a spanner or screw-driver, to detach the wheels from the axle or fit them together in a very short time. B, perfect solidity, the wheels and axles becoming as one piece. C, durability, no need or putting the wheels or axles into the fire, under any circumstances, which is so detrimental to wheels, rendering them remarkably brittle, and which under other systems are detached from the axle by the aid of fire. D, economy in fuel and wages, saving hundreds of pounds yearly to large coal owners. The important desiderata secured by this invention of simplicity (so often wanted in patents), solidity, durability, and economy, have not only been amply illustrated by the technical journals interested in the progress of mining operations in this country, but have at once been fully recognised by leading authorities in the mining world.

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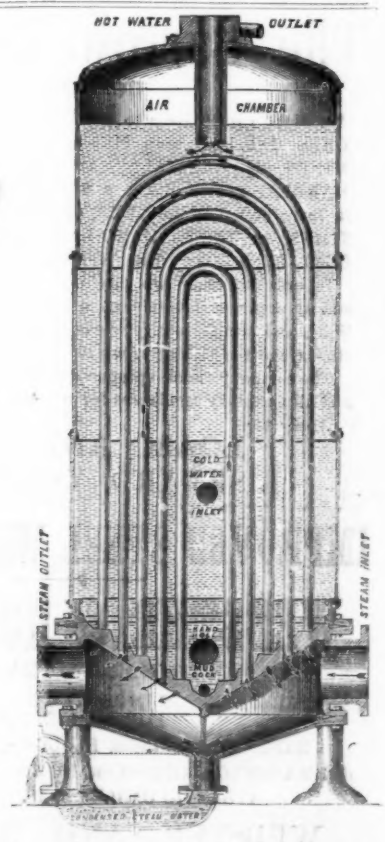
# IMPORTANT.

# JOSEPH WRIGHT AND CO.

## (LIMITED),

## NEPTUNE FORGE ENGINE AND BOILER WORKS,

# TIPTON, STAFFORDSHIRE,




Having purchased the Engineering Business lately carried on by R. BERRYMAN AND CO., at 23, Congreve-street, Birmingham, and 28, Wilson-street, Finsbury-square, London, have removed the whole to their Works at TIPTON, to which place ALL COMMUNICATIONS SHOULD IN FUTURE BE ADDRESSED, and where the BERRYMAN HEATER can be seen at work, and in every stage of manufacture.

Being the SOLE MAKERS and PATENTEES of these CELEBRATED COAL SAVERS and EXHAUST STEAM UTILISERS, and having remodelled and greatly improved them, adding largely to their HEATING SURFACE and WATER CAPACITY, J. W. and Co. have put down a special plant, which includes an entire new set of improved patterns, enabling them to offer these FEED WATER HEATERS to the public at

## GREATLY REDUCED PRICES.

This arrangement of BRASS TUBES of a great length giving an enormous HEATING SURFACE makes this HEATER not only the MOST POWERFUL ever invented, but its FIRST COST PER FOOT OF HEATING SURFACE IS LESS THAN HALF THAT OF ANY OTHER. It will condense the whole of the Exhaust Steam from the Engine if required, and entirely does away with the NOISE and BACK PRESSURE from exhaust pipes.

ALL THE TUBES ARE OF SPECIALLY PREPARED SOLID DRAWN BRASS AND COPPER; both ends are expanded into the bored holes of the same Tube Plate, METAL to METAL, and every tube is free to expand and contract independent of each other. Leakage is impossible, as, when the tubes are once fixed, nothing short of cutting out will remove them. No scurf adheres to the tubes because of the difference of expansion between SCURF and BRASS. The inside of the Heater can be washed out by means of the mud cock and hand hole whilst at work.

Only one pump or injector is required, and as the Heater is placed between the pump and the boiler, the water is forced, COLD, into it, and passes out at the top HOT into the boiler direct. Where the WATER WORKS PRESSURE is sufficient no pump or injector is needed.

The water being heated to BOILING POINT UNDER PRESSURE in the Heater, a saving of from 20 per cent. to 25 per cent. in fuel is effected; the disastrous results of grease in boilers are also avoided, the sewage and other loose matter in the water being deposited in the Heater, the acids are liberated there instead of in the boiler.

Every part can be lined with BRASS, COPPER, or LEAD, as may be required in special cases for heating water or any kind of liquor in large quantities for CHEMICAL WORKS, BATHS, WASH-HOUSES, AQUARIA, GREENHOUSES, BREWERIES, WOOL WASHING, DYE WORKS, TANNERIES, &c., &c.; they will also HEAT AIR FOR CUPOLAS AND BLAST FURNACES, and are now at work as INTERHEATERS for compound engines with direct steam from the boiler with a further saving of 15 per cent.

The New Price List, with detail information, is now ready, and will be sent on application, together with an Illustrated Catalogue, with references and testimonials from Firms using TWO HUNDRED AND THIRTY-THREE of these Heaters

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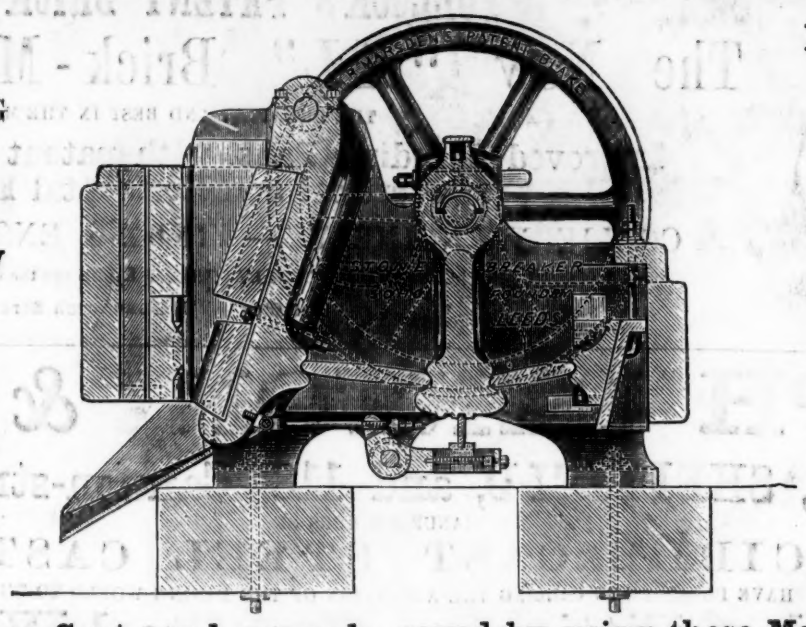

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6, Queen-street-place, May 10, 1877.

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We are, yours faithfully, JOHN TAYLOR AND SONS.

H. R. Marsden, Esq.

Royal Agricultural Show, Liverpool, July, 1877.

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Yours, truly, WILLIAM PRICE, Contractor, Gold Cliff, Monmouth.

H. R. Marsden, Esq.

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HARDWICK COLLIERY CO., Clay Cross, near Chesterfield.
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